JAN 24 1936
MEDICAL LIBRARY

The Physiotherapy Review

Volume 16 Number 1

Table of Contents

	Page
Diagnosis and Treatment of Poliomyelitis—Ruth Jackson, M. D.	3
The Significance of the Short Back Muscles—Beatrice Woodcock	6
Results of the Treatment of Erysipelas—M. E. Knapp, M. D.	9
Artificial Fever Therapy—Robert M. Stecher, M. D.	10
Three Exercise Groups—Georgia May Schori	12
Exercises for Spastic Paralysis—Gladys Wilson	15
Physical Therapy in Peripheral Nerve Surgery—P. M. Girard, M. D.	17
The Treatment of Scoliosis—Ike Kendrick, M. D.	17
The Importance of Early Physical Therapy in Injuries to the Elbow Joint—Somers B. Sleep, M. D.	18
Physical Therapy in Chronic Shoulder Disabilities—W. B. Carrell, M. D.	19
Editorial	20
Abstracts—John S. Coulter	22
Book Reviews	27

Published Bi-Monthly By
THE AMERICAN PHYSIOTHERAPY ASSOCIATION
JANUARY-FEBRUARY, 1936
Minnesota, Ohio, Texas, Washington Number

The American Physiotherapy Association

Executive Committee

PRESIDENT

MRS. SARAH U. COLBY.....
.....932 N. Curson Ave., Los Angeles, Calif.

VICE-PRESIDENTS

CATHERINE WORTHINGHAM .....
.....San Jose State College, San Jose, Calif.

LUCILE GRUNEWALD.1411 Mar Vista Ave., Pasadena, Calif.

TREASURER

SUSAN G. ROEN.....2417 S. Hope St., Los Angeles, Calif.

SECRETARY

MISS JEFFERSON BROWN.....
.....Adelaide Tichenor Clinic, Long Beach, Calif.

BOARD OF DIRECTORS

MRS. CAROLINE BROWN..78 Treadwell, New Haven, Conn.
MARGARET CAMPBELL.....950 E. 59th St., Chicago
MARIE FACKT.....427 Majestic Bldg., Denver
CONSTANCE GREENE....53 Burpee Rd., Swampscott, Mass.
FLORENCE PHENIX....522 No. Pickney St., Madison, Wis.
MARY E. ROCKHILL.....754 Wright Ave., Camden, N. J.

Standing Committees

MEMBERSHIP COMMITTEE

LUCILE GRUNEWALD.1411 Mar Vista Ave., Pasadena, Calif.

COMMITTEE ON EDUCATION

MILDRED ELSON.....303 E. Chicago Ave., Chicago, Ill.

COMMITTEE ON PUBLICITY

CATHERINE WALLACE.....55 S. 6th St., San Jose, Calif.

LEGISLATIVE COMMITTEE

HAZEL FURSCOTT .....219 Fitzhugh Bldg., San Francisco

ADVISORY COMMITTEE

CHARLES LEROY LOWMAN, M. D., Chairman.....
.....Los Angeles, Calif.
JOHN S. COULTER, M. D.....Chicago, Ill.
FRED H. CLARK, M. D.....Long Beach, Calif.
W. H. HAPP, M. D.....Los Angeles, Calif.
PAUL MCKIBBEN, M. D.....Los Angeles, Calif.

Chapter Directory

Central New York Chapter
President, Dorothy L. Lewis, Marcy State Hospital, Marcy, N. Y.
Secretary, Sarah E. Wright, 736 Irving Ave., Syracuse, N. Y.

Chicago Chapter
President, Pauline Plummer, 500 Fullerton Pkwy.
Secretary, Carolyn Hammond, 4506 Beacon St.

District of Columbia Chapter
President, Mrs. Marie T. Stutz, 1711 N. Y. Avenue, N. W.
Secretary, Emma E. Vogel, Walter Reed Hospital.

Massachusetts Chapter
President, Dorothy Frederickson, 11 Chesley Road, Newton Centre.
Secretary, Isabelle M. Knopping, 623 Morton St., Mattapan.

Michigan Chapter
President, Emily Adams, 9600 Dexter Blvd., Detroit.
Secretary, Ruth Hallett, Willard School, Highland Park.

Minnesota Chapter
President, Elma Harrison, 3500 Logan Ave., Minneapolis.
Secretary, Laura Black, 3631 Pleasant Ave., Minneapolis.

New Jersey Chapter
President, Janet North, St. Barnabas Hosp., Newark.
Secretary, Dorothy Johnston, 105 Biglow St., Newark.

New York Chapter
President, Helen Regan, Polyclinic Hosp., W. 50th St., New York.
Secretary, Mr. Alpha Solley, 511 Lexington Ave., New York.

Northern California Chapter
President, Florence Burrell, 203 Grand Ave., Oakland.
Secretary, Ethel Johnson, 490 Post St., San Francisco.

Ohio Chapter
President, Emmy Kylin, 2218 St. James Pkwy., Cleveland Heights.
Secretary, Ruby I. Koch, Lakeside Hospital, Cleveland.

Oregon Chapter
President, Miriam R. Ewing, 1808 N. E. Knott St., Portland.
Secretary Elizabeth Doyle, 1002 W. Salmon St., Portland.

Pennsylvania Physiotherapy Association, Inc.
President, Marion Bryant, 1431 Spruce St., Philadelphia.
Secretary, Louise Jetter, 17 E. Style St., Collingswood, N. J.

Rhode Island Chapter
President, Josephine Frey, Thayer St., Providence.
Secretary, Ellen Peters, 4 Lockwood St., Providence.

Southern California Chapter
President, Emma Hansen, 1200 N. State St., Los Angeles.
Secretary, Dorothy A. Graves, 1200 N. State St., Los Angeles.

Texas Chapter
President, Marion van Tassel, 218 N. Westmoreland St., Dallas.
Secretary, Irene Mae Lang, 1001 Medical Arts Bldg., Ft. Worth.

Washington Chapter
President, Gudrun Brask, 929 Medical-Dental Bldg., Seattle.
Secretary, Betty Rice, Children's Orthopedic Hospital, Seattle.

Western New York Chapter
President, Marion Davis, 50 Merriman St., Rochester, N. Y.
Secretary, Lelia Zernow, 501 Professional Bldg., Rochester, N. Y.

Wisconsin Chapter
President, Lois Mitchell, 211 S. Rankin St., Appleton.
Secretary, Helen Schneider, Wisconsin General Hospital, Madison.

Membership in The American Physiotherapy Association is $8.00 a year, including $3.00 subscription for THE PHYSIOTHERAPY REVIEW. Single copes 35 cents. Subscription for non-members to THE PHYSIOTHERAPY REVIEW $2.50 a year. Single copies 50 cents. Entered as second class matter Mar. 30, 1934, at the post office at Chicago, Ill., under the act of Aug. 24, 1912.

Publication Office: 303 E. Chicago Ave., Chicago, Ill.

The Physiotherapy Review

Published Bi-Monthly by The American Physiotherapy Association

Volume 16 January-February, 1936 *Number 1*

Diagnosis and Treatment of Poliomyelitis

Ruth Jackson, M. D.

Although there has never been an epidemic of poliomyelitis in this part of the country, we do see many cases of this disease. I realize that the diagnosis of poliomyeltis is usually made before the orthopedist sees the patient. However, I would like the privilege of making a few remarks concerning the early diagnosis.

During an epidemic everything from arthritis to hysteria is called "polio". The cases that occur sporadically are seldom diagnosed unless paralysis develops. Brahdy and Lenarsky on reviewing 1123 cases admitted to the Willard-Parker Hospital with the diagnosis of poliomyelitis, found that one hundred and thirteen did not have the disease and that thirty-eight other diseases were found. Gordon reviewed four hundred and forty-six patients admitted to the Herman-Keifer Hospital and found that a correct diagnosis had been made in only fifty per cent of the cases.

This difficulty in diagnosis can doubtless be explained by the fact that the early symptoms of the disease simulate those of most of the acute infectious diseases. On the other hand there may be no evidence of an infection preceding the paralysis. Then, too, forty-eighty per cent of the cases never develop paralysis.

Three stages of the disease are usually recognized. The first stage is one in which symtoms resembling a general systemic invasion occur, lasting from one to two days. The symptoms may be severe or so mild that this stage is entirely overlooked. The second stage is recognized by symptoms resembling, primarily, meningeal irritation and may occur directly following the first stage or after an interval of several days. This is called the preparalytic stage. The patient becomes very apprehensive, irritable, and has a headache, an ataxic tremor, stiffness of the back and neck, altered deep reflexes, hyperesthesia, and muscular tenderness. The third stage, if it occurs, follows soon after the second stage and is characterized by paralysis.

The spinal fluid examination is of no diagnostic value in the first stage, but is of value in the second stage, although the findings vary greatly. The cell count may vary from normal to several thousand, the average being one hundred and fifty to three hundred. There is pleocytosis with about fifty per cent multilobed cells on the first day, rapidly changing to ninety per cent mononuclears. Culture of the spinal fluid is sterile. Globulin is increased, and sugar may be normal or increased.

The opinion that poliomyelitis is a general systemic disease, caused by a filterable virus which later localizes in the central nervous system, is not quite true The virus has never been found in the blood stream. Faber, Fairbrother and Hurst, and Brodie, working independently with experimental monkeys, have shown that the virus enters the spinal cord along the axis cylinders of the nerves, entering first the olfactory bulbs by way of the nasal mucosa, thence to the hypothalmic region, medulla, posterior horn cells, posterior root ganglia, and finally the anterior horn cells. The socalled meningeal symptoms, or preparalytic symptoms, are doubtless caused, therefore, by the action of the virus upon each of these regions, and there is probably no clinically recognizable stage in which the nervous system is free of infection. Walshe believes that the fact that forty-eighty per cent of the patients recover without paralysis is due to the neutralization of the virus before it has damaged the anterior horn cells sufficiently to impair their function. Other authors, too, believe that the virus enters the spinal cord along azonal channels and explain the appearance of poliomyelitis following tonsillectomy on the belief that the virus follows the course of the ninth nerve.

There are no pathognomonic signs or symptoms, but the most constant findings are those of muscular tenderness, hyperesthesia, altered deep reflexes, marked apprehensiveness, and a temperature that rarely goes above one hundred and two and which is out of proportion to the symptoms.

After paralysis has developed the diagnosis is still not so easy as one might think. Pseudo-paralysis of scurvy, cerebral palsies, birth palsies, cerebral tumors, sinus thrombosis, encephalitis, brain abscess, transverse myelitis, syringomyelis, Freidreich's ataxia, progressive muscular atrophy, muscular dystrophy, multiple neuritis, spina bifida occulata, amourotic family idiocy, myotonia congenita, injuries and dislocations of joints, and hysteria have been diagnosed as poliomyelitis. Encephalitis following measles, whooping cough, and diphtheria offers confusion. One patient was sent to me with a diagnosis of infantile paralysis who had chorea. Frequently we get cases of spastic paralysis, which have been diagnosed as poliomyelitis. This is almost unpardonable, but perhaps there is some subtle motive behind such a diagnosis.

A differential diagnosis cannot be made at this time. Confusion will be less, however, if we remember that the lower motor neurons are involved and that the paralysis is flaccid in type. The paralyses are scattered and many bizarre combinations may occur in that the anterior horn cells are damaged more or less at random throughout the spinal cord. The paralyzed muscles show reaction of degeneration. After a few weeks or months the sensory changes seen early have disappeared. Muscular atrophy occurs early and is marked. The deep reflexes are diminished or absent in the affected area. The

Read before Dallas County Medical Society, September 12, 1935.

extremity involved is usually cold, and has a pale, bluish, or mottled appearance.

EARLY TREATMENT

A vast amount of experimental work has been done in the treatment of this disease since Netter in 1911 began using convalescent serum, animal serum, blood from immune donors, and Rosenow's streptococcic serum, with the belief that they possess some in-vivo virucidal or bacteriocidal properties. Experiments on monkeys brought forth the conclusion, finally, that serums might be of value in producing a passive immunity but were of no value in controlling the disease once it had developed. The serum enthusiasts, however, have reported good results, and have been firm in their convictions. Most authors, however, believe that serum therapy is of little value in practice unless used in the preparalytic stage, and nearly all report a rapid systematic response to the administration of serum by an immediate drop in temperature and marked improvement in symptoms. However, the results reported are not convincing enough for the conclusion that serum therapy plays any definite role in preventing or diminishing the disease.

Dr. Josephine Neal, back in 1916, questioned the efficiency of serums, and checked over the epidemic of that year to find that the results in the treated cases were no better than the results of the untreated cases. No controls, however, had ever been run until Park and others during the epidemic of 1931 in New York and Connecticut undertook to give the serum to alternate cases, and when the epidemic had run its course it was found that serum therapy was of no actual value in treating the disease.

Spinal drainages have doubtless been of more value than any form of therapy in the actual treatment of the disease.

It has been believed for years that our greatest hope for combating this disease lay in prevention. Until four years ago a successful vaccine had not been made. At that time Lawrence Brodie, a young Canadian, resurrected an old formaldehyde vaccine which had been a total failure, remade it, and proved experimentally that it was safe and of definite value in the production of immunity. Dr. W. H. Park, who has done much work in poliomyelitis, brought Brodie to his laboratory in New York City, and there they have worked to perfect the vaccine. During the epidemic in California n 1934 the vaccine was given to over 1600 children, and not one of them developed the disease. It has been used this past summer during the epidemic in North Carolina and Virginia, but as yet its value has not been definitely established.

Kolmer of Philadelphia has made a vaccine of living, but attenuated virus in a solution of sodium ricinoleate which he has proven to be of value. Kramer has, also, made a vaccine. However, much more work is required before any statement concerning their definite value can be made. Dosage, duration of immunity, and tests for natural immunity will require more experimentation. I am sure, however, that the vaccine offers us more hope for combating this disease than anything that has preceded it.

Barla Szabo, in Hungary, has used rabies vaccine in monkeys, with the belief that two filterable viruses can produce opposite effects in certain fields of operation and thus negate each other's evils. Armstrong and Harrison have instilled alum solution in the noses of monkeys, rendering, thereby, the nasal mucosa impermeable to the virus. This may or may not prove of value. Many kinds of drugs, ex-ray therapy, diathermy, and hyperpyrexia have been used but there is no conclusive evidence to bespeak their value.

If the vaccine does prove successful the orthopedist will not have much place in the treatment of this disease. At the present time, however, the most important factor from the orthopedist's standpoint is the meticulous care of the muscles involved.

The virus of poliomyelitis is no respecter of anterior horn cells, although it seems to have a predilection for the lumbar cord and we find, therefore, the lower extremities involved in forty-fifty per cent of the cases. Usually certain definite muscle groups are affected, that is flexors, extensors, abductors, adductors, rotators, or any combination of these. Sometimes only the muscles of the spine or abdomen are involved. Why certain areas of the anterior horn cells should be damaged, while others near at hand escape, cannot be determined.

All cases of poliomyelitis should first have a thorough muscle examination. This should be made by a physician who is trained in making such an examination, and not left for a physical therapist or office assistant to do.

In the acute stage, the one and only treatment is absolute rest and relaxation of the paralyzed muscles. If it is impossible to tell which group of muscles is likely to be the most severely affected the limbs should be completely immobilized in a neutral position, with the patient prone. If, however, a definite group is found to be paralyzed or weakened, that group of muscles should be immobilized in a well relaxed position. This prevents contractures and gives the muscles the best chance to recover. For example, if the extensors of the knee are involved the leg should be kept in full extension. The nurses' favorite stunt of putting a pillow under the knees is absolutely contraindicated. If the knee flexors are involved, the knee, of course, is kept in flexed position.

The correct choice of treatment in the early stage has a definite bearing upon the ultimate functional capacity, and may determine complete recovery or permanent loss of certain movements. However, treatment alone does not always determine the ultimate return of function. Many muscles are doomed regardless of the treatments, and others may recover with marked rapidity. Yet, we feel sure that a paralyzed muscle which is stretched does not recover. There is marked atrophy of the muscles early, and if such muscles are subjected to stretching or are unprotected, the muscle fibers become permanently damaged.

If respiratory difficulties are present due to paralysis of the respiratory muscles, and no doubt the greater percentage of deaths occur because of respiratory paralysis, the patient's life may be saved by placing him in a Drinker respirator. This respirator was designed by Drinker in 1928, and consists of an air-tight chamber in which the patient's body, except the head is placed. With a suitable suction pump and alternating valve arrangement, the pressure inside the chamber is rhythmically varied between atmospheric pressure and a partial vacuum. Respiration is thus induced which is similar to normal respiration, and the patient is kept in the chamber from one to six weeks. If the paralysis is permanent this may only prolong life during the time the respirator is used. If the paralysis is not permanent and the patient survives, he usually continues to breathe when removed from the chamber.

The gullible public clamors for the mysterious, consequently it is difficult to convince the laymen that electricity has no place in the treatment of the acute state. They have heard about it and want it. The physician has to be a good salesman to convince them that it has

no place in the treatment of the acute stage. And certainly at any stage of the disease it is dangerous treatment if used promiscuously.

Some writers recommend heat or warm saline baths during the tender stage, but I feel that absolute rest is by far to be desired and that rest and relaxation is the only treatment in the early stages, or until the tenderness has disappeared. This not only protects the affected muscles and prevents contractures, but it lessens the pain associated with this early stage of the disease.

The type of immobilization is not of prime importance. Some orthopedists use plaster casts, others plaster splints, while others use metal splints. Sometimes it is wise to make a complete plaster of paris bed for severely paralyzed cases. Plaster is of value because it is relatively easy to apply and is always available. It is not always possible to have metal splints made. The Bradford frame makes a convenient foundation for building convalescent splints. Leg and arm attachments may be made to support the limbs in any desired position. If there is paralysis of the hip flexors, the hips may be flexed to relax these muscles. The knees may be extended or flexed, the foot dorsi or plantar flexed, the extremity abducted or adducted, as the case may be. The arms, too, may be held in abduction. This is the usual position because the deltoid is most frequently involved. To fail to keep the arm abducted is an unforgivable error. If the patient can abduct the arm, gravity will adduct it, but if the deltoid is involved and is not properly protected the patient will never be able to abduct the arm.

If the back or abdominal muscles are involved the patient should be kept in the supine or prone position until there is no evidence of further recovery, and should be allowed to get up only with proper support in the way of braces or corsets.

The kind of convalescent splint is relatively unimportant, but the principle must be correct—the avoidance of unequal muscle pull.

LATER TREATMENT

Most orthopedists are agreed that no further treatment should be instituted until all muscle tenderness has disappeared. This period may vary from a few days to several months. There are some, however, who start active underwater exercises before the tenderness has subsided. I feel that the rest and relaxation at this time, in most cases, is of more importance than the exercises.

As soon as the tenderness has disappeared a program of muscle training and reeducation must be started. This consists of active exercises on a table or under water. Under-water exercises have been used only within recent years in the treatment of poliomyelitis. The patient is strapped to an inclined bed or platform and placed in tepid or warm water and there instructed in active exercise of the involved muscles.

This method of treatment is of value because it allows muscles to be exercised that will not function outside of water. Many weakened muscles cannot work against the pull of gravity, but when placed in water have the power to function. This method of exercising has become very popular and is quite universally used. Some authors recommend the addition of salt to the water. This is of advantage because it increases the specific gravity of the water, and hence, allows a greater possibility of movement.

The idea prevalent among the laity that mineral waters possess some mystic powers is entirely unfounded. Ruhrah, in Hygeia, stated that "as the faithful Moslem turns his face toward Mecca, so an ever increasing number of 'polios' are turning theirs to Warm Springs, Ga." for it is there that they are benefited in body. The water of Warm Springs, or any other mineral water, has no more advantage in the treatment of residual poliomyelitis than Dallas drinking water with a little sodium chloride added to it. Therefore, do not let your patients be misled by such erroneous ideas. The exercise is the important factor and not the type of water used.

The under-water exercises may be given daily or alternated with the table exercises. Massage should follow the exercises as this increases the circulation and tone of the muscles. If the exercises are given on a table they should be preceded by heat to the parts. Any ordinary heat lamp or baker may be used. Following the exercise and massage the patient should be returned to the convalescent splints or braces and kept there until the next treatment.

This period of muscular exercise and reeducation should be continued as long as there is any evidence of improvement. We expect the greatest amount of recovery during the first six months, less the following six months, and still less thereafter. I believe it is wise to allow the paralyzed muscles two years before hope of recovery is abandoned. We have seen muscles recover after four or five years, but that is the exceptional case.

If the lower extremities are involved, weight bearing should not be allowed until four months to a year after the onset of the paralysis, and then only with proper bracing and protection of the extremities, unless there is absolute evidence of complete recovery. We have all seen patients whose muscles had apparently recovered allowed to get up too soon, and the muscles become paralyzed again. If the upper extremities, back and abdomen are involved they should likewise be supported with braces until complete recovery has occurred, or until a period of two years has elapsed, at which time operative work may be done.

There are many types of ambulatory braces used, but the type of brace is unimportant as long as it prevents deformities and contractures and enables the patient to resume activities.

If the treatment as outlined here is rigidly followed the development of deformities, contractures, and shortening will be minimized. This requires much patience and optimism on the part of the physician and the parents.

Hospitalization is, of course, to be desired, but the expense is usually so great that it is impossible to carry out the treatment under such an ideal situation. If, however, the physician can gain the earnest cooperation of the parents, the patient may be kept at home and taken to the doctor's office or to the physical therapist each day for treatment. It is even possible in some cases to instruct the parents in giving the exercises and massage, provided the doctor can keep a check on the progress at frequent intervals.

There is another phase of treatment that must be mentioned, which is frequently overlooked or considered unimportant. How can these patients occupy their time while convalescing? Sick bodies may be conducive to sick minds. The branch of science known as occupational therapy solves this problem. Unfortunately this type of therapy has not been employed in this part of the country to any great extent, and very few hospitals here have occupational therapists who can instruct the convalescent patient in basket weaving, leather work, loom weaving, carpentry, etc. To be able to create something is great satisfaction to the physically handicapped individual. This work not only improves the morale of the patient, but he may learn a remunerative trade that will mean economic

independence for a cripple. The exercise necessary for running a loom, a jig saw, weaving, etc., is of definite advantage also, in the reeducation of paralyzed muscles.

A surgical discussion of this subject would require volumes, and is not within scope of this paper. Many operations have been devised, such as joint fusions and tendon transplants, that almost miraculously make physically sound individuals who otherwise would be hopeless social and economic parasites. Rigid institution of the treatment as here outlined will, however, minimize the necessity for surgical procedures.

BIBLIOGRAPHY

Gordon, J. E.: Diagnosis of Early Poliomyelitis. J. A. M. A., 99:1034. Sept. 24, 1932.

Brahdy and Lenarsky: Differential Diagnosis of Acute Poliomyelitis. J. A. M. A., 102:1358-62, Apr. 28, 1934.

Walshe, F. M. R.: Poliomyelitis. Br. Med. Jr., December 30, 1933.

Statinsky and Sheldon: Poliomyelitis. The Jr.-Lancet, Vol. LIV, No. 1.

Pollock, L. J.: Diagnosis of Early Poliomyelitis, Med. Cl. of N. A., Sept., 1933.

Moody and Hesselberg: Poliomyelitis Anti-streptococci Serum. Arch. of Ped., Vol. LI, No. 1, Jan., 1934.

Sherman, Irving: Acute Poliomyelitis, Amer. Jr. Dis. of Chil., Vol. 47, No. 6, March, 1934.

Harmon, Paul: Poliomyelitis, Amer. Jr. Dis. of Chil., Vol. 47, No. 6, June, 1934.

Kolmer and Rule: Chemiotherapy of Experimental Poliomyelitis of Monkeys, Proceedings of Soc. of Exp. Bio. and Med., Vol. 31, No. 1, Oct., 1933.

Schlatz and Gebhardt: Prophylactic and Therapeutic Value of Specific Immune Serum in Experimental Poliomyelitis. Proceedings of Soc. for Exp. Bio. and Med., Vol. 31, No. 2, Nov., 1933.

Fischer, Alfred E.: Human Convalescent Serum in the Treatment of Preparalytic Poliomyelitis, Am. Jr. Dis. of Chil., Vol. 48, No. 3, Sept., 1934.

Aycock, W. L.: Significance of Age Distribution of Poliomyelitis, Am. Jr. Hy., 8:35, Jan., 1928.

Martin, J. P.: The Bearing of Recent Work on Certain Aspects of Poliomyelitis, Br. Med. Jr., Vol. No. 2, Dec. 30, 1933.

Quigley, T. B.: Second Attacks of Poliomyelitis, J. A. M. A., Vol. 102, No. 10, March, 1934.

Schaltz and Gebhardt: Immune Serum Production on Poliomyelitis Refractory Animals, Jr. Im., Vol. XXVI, No. 2, Feb., 1934.

Wilson, J. L.: Respiratory Failure in Poliomyelitis, Am. Jr. Dis. of Chil., Vol. 43, No. 6.

Brahdy and Lenarsky: Treatment of Respiratory Failure in Acute Poliomyelitis, Am. Jr. Dis. of Chil., Vol. 46, 705-728, October, 1933.

Todd, A. H.: Orthopedic Treatment in Poliomyelitis, The Jr.-Lancet, Vol. 2, Nov. 12, 1932.

Hudson and Littern: Neutralization of Poliomyelitis by Serum of Normal Adults, Jr. of Inf. Dis., Vol. 53:33.

Rosenow, E. C.: Specific Reaction of Convalescent Poliomyelitis Serum on Streptococci Isolated in Poliomyelitis, Jr. of Imm., Vol 23, 1932.

Fairbrother and Hurst: Poliomyelitis, Jr. Path. and Bact., Vol. 33:17, 1930.

Barbour, O.: Use of Convalescent Serum and Human Blood in Suspected Poliomyelitis, Ill. Med. Jr., Vol. 33, No. 2, Jan., 1933.

Park, Wm. H.: Serum in Poliomyelitis, Trs. Ass. Amer. Phy., 47:123-38, 1932.

Faber, H. F.: Poliomyelitis, "Medicine," May, 1933.

Neal, Josephine B.: Symptomology and Treatment of Acute Poliomyelitis, N. Y. State Jr. of Med., Vol. 35, No. 16, Aug. 15, 1935.

Brodie, Maurice, Park, W. H.: Active Immunization Against Poliomyelitis, N. Y. State Jr. of Med., Vol. 35, No. 16, Aug. 15, 1935.

Park, W. H.: Prevention of Poliomyelitis, N. Y. State Jr. of Med., Vol. 35, No. 16, Aug. 15, 1935.

Kolmer, J. A.: Vaccination Against Acute Anterior Poliomyelitis, Jr. A. M. A., Vol. 104, No. 6, Feb. 9, 1935.

Barla-Szabo, E. A.: A New Type of Poliomyelitis Therapy. Abst. of Mod. Med., Vol. 3, No. 7, July, 1935.

Armstrong and Harrison: Prevention of Intranasally-inoculated Poliomyelitis of Monkeys by Instillation of Alum into the Nostrils, Public Health Reports 50:22, 725-730, May 31, 1935.

Wolf, H. F.: Prevention of Poliomyelitis in Monkeys by Means of Hyperpyrexia, Proceedings of Soc. of Bio. and Med., 32:7, April, 1935.

The Significance of the Short Back Muscles

In Relation to Scoliosis from Poliomyelitis

Beatrice Woodcock

The gymnastic treatment of scoliosis in the past has stressed the importance of the abdominal and erector spinae muscles, yet in many cases has almost overlooked the short muscles of the back. Deformity in scoliosis is most marked in the dorsal region, where the short muscles are most active—rotation being the principal movement there, particularly in the upper region.

This paper is not to be regarded as dogma. It is not written for a text book, but it is merely the report of impressions formed after ten years' work with such cases.

Visiting the Galaezzie Clinic in Milan in 1932, I was very much impressed with the number of x-rays showing how cases of scoliosis, with marked rotation, were completely de-rotated. Prior to this, the method of exercises I had been using de-rotated by the pelvis. After watching cases applied in Milan, I decided to work out exercises which would follow the same theory; that is, de-rotation by the thorax as well as by the pelvis.

In observing these cases, certain things stand out clearly:

1. That cases of scoliosis from poliomyelitis progress more rapidly than other types.
2. That with improved posture, correct body alignment can be established.
3. That with a body re-aligned, or rather compensated, rotation can and does persistently progress.

The conclusion is that progression is caused by paralysis or partial paralysis of the short back muscle groups, namely the rotatores longus and brevis and the multifidus. In cases where paralysis of these groups is suspected (and there is no way of testing them except to watch for rotation), our problem is how to re-educate such muscles by active and passive exercises or muscle training.

Before further discussion on the type of exercise, let me give some illustrations to stress my point:

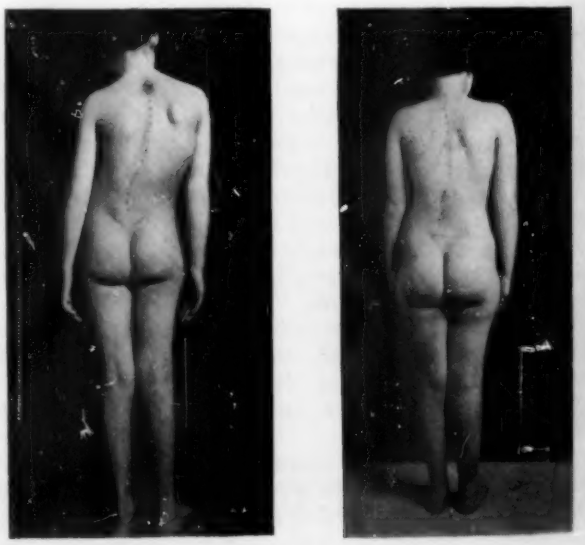

Fig 1.

Children's Orthopedic Hospital, Seattle, Washington

Three years ago a boy of eight came to us just released from quarantine. He had a mixed paralysis involving both legs, both arms, abdominals and erector spinae muscles.

There was marked imbalance of the abdominals, which were strong enough on the left to pull the umbilicus well over. The right side was very much weaker. Correspondingly, the erector spinae group showed the same imbalance. After thirteen months' treatment he had made complete recovery in arms and legs, but still showed marked imbalance of the abdominals and the long back muscles.

Fig. 2.

Before being discharged from the house, a body brace was made to correct the list, which was evident on walking. The child is now an out-patient and reports regularly.

The weak abdominals and back muscles have improved a little, but there is still marked imbalance. He has no scoliosis and the list to one side is corrected.

A girl of nine came to us from Alaska, one year after attack. She showed a scattered paralysis of arms, legs, back and abdominals. There was the same imbalance as in the boy, though not so marked. She had a definite scoliosis with marked trunk displacement, though the x-ray showed only a little rotation.

After one year's treatment she was much improved, although there was not a complete recovery as in the boy. The curvature was decidedly better; the body was realigned and the trunk displacement corrected. This was probably due to the fact that the short back muscles were either not involved or only slightly so. (See fig. 1.)

Fig. 4.

This year a girl of twelve came to us. She was well nourished and well developed, had excellent muscle tone and was quite an athlete. However, she gave a history of sickness at the time of the epidemic, but had no noticeable paralysis. Six months later she had developed scoliosis with marked rotation. A careful muscle test revealed no weakness except in the gluteus maximus on the right, which was a good plus. There is only one conclusion and that is that the short back muscle group was involved and so allowed rotation to develop.

In the clinic it is remarkable to notice the number of cases with a short leg which gives a definite list, yet corrects with a raise on shoe, when back muscles are intact; also, there are numbers with paralysis of the abdominals which do not develop scoliosis. These findings emphasize the need for concentrated work on the short muscle group in all cases where there is rotation.

Like any other muscle group involved, the sooner the training is started, the better the end result. Also, as in other parts of the body, where one group of muscles is stretched, the opposing group is contracted and this calls for many passive exercises. Bone is plastic, otherwise deformities could not occur and we should be able to at least partially correct.

Exercise, of course, cannot be expected to accomplish this, but if tight muscles are stretched, overstretched muscles toned up and then held in these positions by casts, all cases could be improved and progression of deformity prevented.

Scoliosis should be divided into two classes:

1. Those needing exercises for re-alignment only, which would include cases of congenital scoliosis where

Fig. 4.

deformity is fixed and exercises are given only to tone up muscles so as to hold after fusion.

2. Those with paralysis of the short muscle group where de-rotation is imperative.

All our cases are placed on frames and put in head and pelvic traction and report daily to the gymnasium.

In the gymnasium we specially emphasize klapp creeping to loosen up the lumbar spine and develop all the back muscles. We also give general posture work, such as deep breathing, abdominal re-

Fig. 3.

Fig. 5.

traction and pelvic rotation, leg raising and lowering, hyper-extension of arms, and shoulder rolling.

Lovett claims that de-rotation is best accomplished in the erect position with the pelvis fixed. However, Galeazzi applies all his casts with the trunk in flexion. One thing is certain, and that is that no de-rotation is obtained in extension.

Our de-rotation chair is made after the model of Dr. Steindler, except that we have added a movable clamp for the thorax. In this chair we can passively de-rotate by the thorax and by the pelvis. (See fig. 2.) Each passive exercise is followed by an active exercise.

After the chair work we give the following:

Sit at mirror with legs wide apart. Raise arms upward and outward and turn trunk to right or left as indicated by curve, then bend forward and touch toes with opposite hand. (See fig. 3.) This exercise can be done well only if the lumbar spine is well loosened up. There are many active and passive exercises that can be given on the gymnasium plinth, such as side lying over the edge of the table, bending the trunk against gravity and de-rotating. This can also be done face-lying. Rolling exercises constitute some of the best trunk exercises we have, but they must be properly done.

Fig. 4 shows rolling starting with the left hip to de-rotate the right curve. Fig. 5 shows rolling starting with the right shoulder to correct the left curve. This girl had weakness of the lower trapezius, serratus, and intrinsic muscles. Compare rolling picture with that of the standing position. One of the interesting things about this girl is that the serratus power has come back to such an extent that she takes good resistance on the tests, yet the scapula still wings. The rotation in this case has gone down remarkably and the fusion which was planned has been avoided. The girl is instructed to sleep on a frame until she is eighteen years old and to continue with exercises, particularly those which de-rotate.

In curves which are as high as this one, it is much more difficult to work out exercises which will bring about the desired result. We teach this girl to shift and then de-rotate.

All of our work is done under the direction of the orthopedic men on the staff and submitted to them for approval.

The Measurement of Ultraviolet Radiation in Daylight

J. S. Owens, M.D., A.M.I.C.E., Superintendent of Observations on Atmospheric Pollution, Department of Scientific and Industrial Research; in Lancet, CCXXIX:5845:589, Sept. 7, 1935.

The growing appreciation by physiologists of the value of ultraviolet radiation and the need for some simple means of measurement has prompted me to devise the apparatus described below. The principle upon which it is based has been tried before in different forms, and usually involves the use of an optical wedge. This admits light to a sensitized paper above which is an opaque plate having a row of small holes, and the amount of light reaching the paper through these holes is graduated by the superimposed wedge or its equivalent. We should thus get, with a bright illumination, a greater number of spots on the paper than with a faint illumination, and the number of spots becomes a measure of the amount of light falling on the apparatus. There are, however, serious difficulties in finding an optical wedge suited for use with ultraviolet light, and several methods which have been tried have failed owing to this.

Results of the Treatment of Erysipelas

With Ultraviolet Radiation

M. E. Knapp, M. D.

Ultraviolet radiation has been used for a number of years in the treatment of erysipelas. However, it was used only sporadically and without much controlled clinical evidence until Ude and Platou of the Minneapolis General Hospital, in 1930, reported a series of seventy-nine cases treated by ultraviolet alone. The results in these cases were compared with the results in cases treated by x-ray, by antitoxin, and by magnesium sulphate and glycerine packs. The comparison showed that ultraviolet radiation was the method of choice, for it shortened the duration of the disease considerably. Roentgen radiation gave nearly equal results, but is of course a much more dangerous method of treatment.

No really satisfactory explanation of the mode of action of ultraviolet radiation in erysipelas has as yet been advanced. At first it was thought to be directly bactericidal in vivo as it is in vitro, but this has now been shown quite definitely to be untrue. Norman Titus has advanced three major possibilities as theoretical explanations of the action. First, after studying in a series of one hundred fifty patients who were sensitive to a certain strain of streptococcus their reaction to the irradiated nucleoprotein of the bacteria, he concludes that, "The effects are due to a chemical reaction brought about in the skin upon certain protein substances, either an effect upon the nucleoprotein of the bacteria themselves or a change in the chemical composition of the tissues, so that there is an increased resistance to the sensitizing action of the bacteria." Second, "inasmuch as the dosage that has been used creates a true edema of the skin, even to such an extent as to cause the formation of blebs, it is reasonable to consider that this transudate of serum may be affected in such a way as to form an auto-antitoxin." Third, very likely the prolonged erythema of the skin resulting from the intensive application of ultraviolet used is also an important factor.

Titus, as well as Nightingale and Starr and many others, advocates the use of ultraviolet radiation in preference to other methods. Lavender and Goldman published a report this year in which they stated that they have changed from the use of antitoxin to the use of ultraviolet in the treatment of erysipelas.

Technic:

The essential points that must be observed in the successful treatment of erysipelas by ultraviolet radiation are as follows: First, the dosage given must be adequate. At first the dosage given was approximately double the erythema dose following the technic described by Ude. More recently, however, we have gradually increased the dosage until we now give twenty times the erythema dose, using the cold quartz type of lamp. Second, the lamp must be close to the patient in order to get as high a concentration as possible of the shorter wave-length ultraviolet. Ordinarily about eight inches is the distance of choice. However, care must be taken not to give such a long exposure at this short distance that the patient receives a burn from the infra-red rays generated by an air-cooled mercury arc lamp. Third, a wide area of normal tissue must be included in the irradiated field. Two or three inches at least beyond the edge of the erysipelas should be included in the treatment.

The eyeballs are covered with black paper or cotton unless the eyelids are involved, in which case they are left uncovered. The eyebrows are always left uncovered. When multiple exposures are necessary, the edges are allowed to overlap.

It is not necessary to apply any cooling packs or lotions after treatment. However, it is comforting to the patient to apply white vaseline to keep the skin from feeling too dry during the stages of wrinkling and desquamation.

Clinical Course:

The majority of patients remark about the grateful feeling of relief which accompanies the treatment, often speaking of it while the lamp is still being applied. Later there is some increased edema of both the area of erysipelas and the surrounding normal skin. This subsides in twenty-four to forty-eight hours and, if no further spreads or complications occur, the temperature drops rapidly to normal, the treated area wrinkles, then desquamates, and in five or six days the entire area is replaced with fresh looking skin. The patients are usually discharged before desquamation is complete. In the great majority of cases only one treatment is needed. In this series, two hundred and fifty-four cases or 74.7% were given only one ultraviolet treatment; seventy-one or 20.88% were given two treatments, and the remaining fifteen cases were given three to five treatments. The average number of treatments per case was 1.3. This does not mean that eighty-six cases had extensions occur. In most cases the second treatment was given apparently because the temperature was still elevated, the patient appeared toxic, or the erythema of the lamp was mistaken for a spread. In several instances no reason could be found.

In the entire series of cases that recovered, there were spreads in only twenty-eight cases, or 8.94%.

If a spread occurs after treatment, the spreading area, including part or all of the original area, is given the same dose as was given at the first treatment, or even a slightly larger one, depending upon the reaction of the patient to the previous treatment.

Results of Treatment:

Since September, 1929, there have been four hundred and fifteen hospitalized cases of erysipelas treated at the Minneapolis General Hospital. Of these, three hundred and forty were treated with ultraviolet radiation alone. The results of treatment in these cases have been analyzed by considering the following factors: (1) the duration in days from treatment to normal temperature; (2) the average duration of the disease from treatment to discharge from the contagious disease department; (3) the average duration of the disease from

1147 Medical Arts Building, Minneapolis, Minn.

onset to discharge; and (4) the extension of the disease after treatment.

The temperature was considered normal when it did not rise above 99° F. Cases which ran an afebrile course have been excluded from the calculations as have those in which the temperature elevation was obviously due to complications. The average time from treatment to normal temperature was 3.9 days. The average time from treatment to discharge from the contagious disease department was 8.67 days. The average duration of the disease from onset to discharge was 11.3 days. These figures are closely comparable to those of Ude and Platou which were 3.16, 8.2, and 10.4 days, respectively.

Complications:

In sixty-four cases the erysipelas occurred as a complication of another disease. In other words, the patient was admitted to the hospital for some other disease and the erysipelas developed while the patient was in the hospital. The most common disease was pneumonia, with sixteen cases. Ear, nose, and throat infections and cardiac disease followed with eight cases each. Twelve of the deaths in the series occurred in this group. The complications apparently due to the erysipelas were: subcutaneous abscesses in eleven cases, nephritis in two cases, and cellulitis of the eyelids in two cases. In one case a chronic arthritis of both ankles was lighted up. In two cases otitis media developed and in one case a pleurisy developed during the course of the erysipelas.

Deaths:

Among the three hundred and forty cases there were twenty-eight deaths, or 8.23%, as compared with Ude's 7.6%. Of these, one was considered to be not due directly to erysipelas because the patient was delirious on admission to the hospital four days before the erysipelas developed. At autopsy it was found that the patient had died of encephalomalacia. After excluding this case, the percentage of deaths becomes 7.9%.

The most striking results were obtained in infants under one year of age, where of seven cases not one died while on the contagious service. One child died of broncho-pneumonia after the erysipelas had cleared up and the patient had been transferred to the pediatric service. That is, of course, a marked improvement over the usually reported 40% to 75% fatalities in infants when treated by the older methods.

Conclusion:

Ultraviolet irradiation is an effective method for the treatment of erysipelas. In four hundred and nineteen cases treated at the Minneapolis General Hospital over a period of seven years, this method has given consistently good results.

REFERENCES

1. Ude, Walter H., and Platou, E. S.: Erysipelas—A Comparative Study of the More Recent Methods of Treatment. J. A. M. A., 95:1 (July 5), 1930.
2. Ude, Walter H.: Erysipelas—Further Comparative Studies of the More Recent Methods of Treatment. Arch. Phys. Therapy, 12:16 (January), 1931.
3. Titus, Norman E.: Ultraviolet Light as a Method of Treating Erysipelas. M. Rec., 140:259 (Sept. 5), 1934.
4. Nightingale, L. M., and Starr, S.: The Treatment of Erysipelas in Children—A Comparative Study Showing That Best Results Are Obtained with the Use of Ultraviolet Radiation. J. A. M. A., 102:761 (March), 1934.
5. Platou, E. S., and Rigler, Leo: Roentgen-Ray Therapy in Erysipelas. Arch. Int. Med., 38:573 (November), 1926.
6. Ude, Walter H.: Ultraviolet Radiation Therapy in Erysipelas. Radiology, 13:504 (December), 1929.
7. Titus, Norman E.: Ultraviolet Light. Arch. Phys. Therapy, 14:722-27 (December), 1933.
8. Lavender, H. J., and Goldman, Leon: Facial Erysipelas—Evaluation and Comparison of Specific Antiserum and Ultraviolet Therapy. J. A. M. A., 105:401 (August 10), 1935.

Artificial Fever Therapy

Robert M. Stecher, M. D.

The subject of my remarks this evening falls technically within the proper sphere of your society, the treatment of disease by physical agents. Physical therapy comes down by direct descent as one of the oldest forms of the healing art of which we have knowledge and it has persisted throughout the ages to the present time. Hot water and vapor baths were in common use in ancient Greece and Rome as health preserving and health restoring procedures and the ruins of their elaborate public baths remain as testimony of the esteem in which they were held. The semi-civilized Indians of Yucatan devised large treatment rooms accommodating many invalids at one time, where patients were subjected to hot water vapor and steam produced by pouring water on previously heated rocks. The barbarous Indians of North America apparently made regular pilgrimages to the various natural hot springs and sulphur baths located throughout the land in search of health and surcease of pain, even as the present day citizens continue to do. Massage may be considered to have had its origin in biblical times for we are told of the healing effects of the laying on of hands. From such primitive origins you have developed a highly specialized art which today rests firmly upon a sound scientific base. As physical therapists, you have been progressive in your attitude and have adapted to your needs, promptly and effectively, the most recent advances in the world of science to develop new methods of relieving pan, restoring function and healing disease.

The idea of producing an artificial therapeutic fever had its origin in the field of internal medicine. Fever had been considered an undesirable accompaniment of disease until Wagner von Jauregg demonstrated the efficacy of malaria in causing remissions in general paresis. This treatment rapidly became popularized so that today it is firmly established as a recognized and almost universal form of therapy in central nervous system lues. In attempts to improve malarial therapy, to avoid its undesirable features and to circumvent its limitations, other methods of fever therapy have been developed—too many to discuss in detail. It will suffice to mention fever production by protein shock, diathermy, radiothermy, inductothermy, infra-red lamps, hot vapor baths, hot packs and hot air cabinets. These various methods have their own advocates and enthusiastic supporters. They also have their advantages and their disadvantages. The method of choice depends largely upon the height and duration

From the Department of Medicine, Western Reserve University at City Hospital, Cleveland, Ohio.

An address delivered October 12, 1935 at the meeting of the Ohio Chapter of the American Physiotherapy Association, Lakeside Hospital, Cleveland, Ohio.

of fever desired and the probable number of times it may seem necessary to repeat the treatment. It is desirable that this be accomplished as cheaply as is practical with a maximum of safety and a minimum of discomfort to the patient.

Our experience with fever cabinet therapy at Cleveland City Hospital extends over a period of eighteen months during which time about 850 treatments have been administered to 150 patients with various diseases. Particular attention has been given to different forms of arthritis and the complications of gonorrhea. Other diseases have been treated with questionable results and will not be mentioned. It seems appropriate to describe in some detail the apparatus used and the technique employed and to discuss briefly the physiological effects of treatment. The results obtained will be given here only in general form.

The apparatus used is the Kettering Hypertherm (Footnote). This consists of a cabinet large enough to accommodate comfortably the body of a large man in the prone position, with his head on a pillow outside. The patient rests on an air mattress lying on a cart which is an integral part of the cabinet. This cart pulls out full length to facilitate loading the patient into the cabinet. With the patient in position the cart is pushed into the cabinet which is then sealed at the end by sliding down the door which has a hole cut in it to allow for the neck. An electric fan attached to the cabinet furnishes a breeze on the face. The cabinet is provided with a large sliding door on each side to allow for the taking of rectal temperatures, the periodic examination of the patient's skin and the arranging of blankets as necessary. Fever is produced by passing heated and humidified air over the patient's body. A separate compartment at the foot of the cabinet contains a resistance coil heating element to heat the air, and a blower at the top of the cabinet which forces air forward between the real top and a false top to escape through large holes near the head of the cabinet. This air passes over the patient's body and returns to the starting point through a grating. A second heating element in a pan of water produces humidity by boiling. Automatic controls maintain air temperature and humidity at the desired levels.

The standard treatment consists of a temperature of 105° F., rectally, maintained for five hours. The patient arrives at the treatment room at eight o'clock in the morning, after a light breakfast or in a fasting state. After recording the temperature, pulse, blood pressure and weight, the patient is placed in the cabinet and all covering is removed. The air temperature of the cabinet, which is about 125° F. at the start of the treatment, is raised as rapidly as possible to about 150° F. and the relative humidity is kept between 30% and 40%. The patient's temperature rises to the desired level in from sixty to ninety minutes. At this time, the body is covered with a light blanket, the fan is directed on the face, iced water or 0.6% saline is given as desired and ice may be rubbed on the face. The air temperature and humidity of the cabinet is adjusted from this time to the lowest level at which the desired body temperature can be maintained. When the treatment is finished, the cart is withdrawn from the cabinet, the fan is turned on the patient who is still covered with a light blanket and the temperature falls in about an hour to the pre-treatment level. After a bath the patient is sent to the ward or allowed to go home.

Throughout the treatment a nurse is in constant attendance to minister to the patient's wants and desires, to observe and record at least every fifteen minutes the rectal temperature, cabinet air temperature and humidity. It is her duty to keep the patient as nearly happy and comfortable as is possible under the rather trying circumstances imposed. In spite of various sedatives such as sodium amytal or morphine in generous doses, patients may be apprehensive, restless and uncomfortable. In many cases the continuation of the treatment depends to a considerable extent upon the ability of the nurse to entertain, distract, persuade and cajole. The skin is watched carefully for the appearance of possible burns which are most likely to appear in scars or over the bony prominences and are more prone to occur in blonds than darker skinned individuals. When suspicious areas are noted, they are given gentle massage, cooled by rubbing with ice and protected with extra pads. Inasmuch as the skin of the toes is especially vulnerable, heavy canton flannel boots are placed over the feet before putting the patient in the cabinet. Occasionally treatments must be terminated prematurely because of blisters.

Cabinet fever therapy produces certain well-recognized physiological effects. Hot air to the skin stimulates respiration to such an extent that definite alkalosis is produced, occasionally of such severity as to be accompanied by tetany. Hyperventilation is reduced when morphine is used. Tachycardia is frequently observed. Pulse rates of 180 or 200 per minute occasionally are observed for short periods when the patient is restless. A pulse rate of 160 or more lasting over half an hour usually is sufficient reason to stop treatment. On the other hand, patients are seen with a temperature over 104° F. and pulse rate under 120 per minute. The blood pressure falls gradually and at the end of treatment may be as low as 80 m.m. of mercury systolic. Because of the marked vasodilatation, the diastolic pressure becomes very low, often falling to zero and giving rise to all the peripheral signs of wide open aortic insufficiency, such as water hammer pulse, capillary pulse and the pistol shot sign over the femoral arteries. Patients usually consume from two to four quarts of water during the treatment period so that loss of weight rarely exceeds three pounds.

Certain variations from the above procedure are frequently used in treating arthritis. Patients with generalized chronic arthritis of long standing do not tolerate such severe treatment. They suffer weakness, lassitude and loss of appetite for as long as ten days after a standard treatment. It is our custom to prescribe shorter periods at lower temperatures, never longer than four hours between 103° F. and 104° F. and occasionally as short as two and a half hours. This depends largely upon the patient's state of nutrition, range of physical activity and general vigor. Fever treatment in such cases if not overdone, gives prompt relief from pain and stiffness in varying degrees which in many cases lasts several days to several weeks. Repeated treatments increase the degree of relief and prolong its duration in successful cases. No cures have resulted in this type of arthritis but many patients have been benefited sufficiently so that they could tolerate physical therapy or orthopedic procedures for the correction of deformities. Some patients have retained their benefit for six months or a year but others continue to receive occasional treatments.

Only about one-third of the patients with chronic arthritis have enjoyed substantial benefits that have resulted in increased comfort and greater activity. The series contains a high percentage of very severe cases and I believe the results have been better than could have been attained without fever therapy.

Patients with gonorrhea or gonorrheal arthritis were regularly given treatments of fever between 106° F. and

107° F. maintained for six or seven hours if possible. Some patients could not tolerate this and treatments were shortened because of blisters of the skin, unwillingness to submit, deliriums, or, very rarely, because they appeared about to collapse. Occasionally one treatment has been sufficient to give relief from arthritis and once it seemed to effect a cure of gonorrheal prostatitis, but four to eight treatments were usually given. Three-fourths of the patients with gonorrheal arthritis noted restoration of normal joint function, and a complete relief of signs of joint inflammation. Arthritis was relieved in most cases before the genital infection was cured. In a few cases treatments were continued and consistently negative smears obtained. Gonorrheal infections of the eye yielded promptly to fever in most cases.

The results in acute non-specific arthritis were similar to those obtained with gonorrheal arthritis but with a slightly lower percentage of relief, only about two-thirds of the cases enjoying symptomatic cure.

Fever cabinet therapy has proved to be a practical and satisfactory method of treatment in the above conditions. Its application requires considerable care and constant watchfulness on the part of a trained personnel under the direction of a responsible head. In over 850 treatments, no fatalities have occurred and serious complications have been rare but the latter occur occasionally to remind us of a certain potentiality for disaster.

In this presentation, the clinical results have been given in a very general and sketchy manner so that more time could be devoted to technique. It seemed that this phase of our experience might be of greater interest to a meeting of physical therapists. It appears that fever therapy may technically be considered as belonging to internal medicine or physical therapy. Regardless of the final decision on that point, the induction of artificial fever is a firmly established therapeutic measure. The only arguments about it are those concerning the methods of its accomplishment, the diseases to be treated and the degree of benefit which may be expected from it.

Footnote—Three Kettering Hypertherm Fever Cabinets have been in use at City Hospital since March, 1934. They were furnished for clinical trial through the generosity of Mr. C. F. Kettering of General Motors Corporation, Dr. Walter F. Simpson of the Miami Valley Hospital, Dayton, Ohio, and the Figidaire Corporation.

Three Exercise Groups

Georgia May Schori

CHRONIC INFECTIOUS ARTHRITIS

The patient in this group was admitted to the hospital on October twenty-seventh, 1933, age twelve years, with a history of a severe arthritis at the age of six, which, at first, involved the right knee and gradually all the other joints. This cleared up but returned three years later, and the joints had become progressively deformed and stiffened since that time.

Fig. 1A.

Fig. 1B.

Fig. 1C.

Fig. 1D.

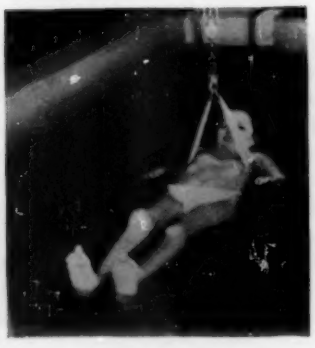

Fig. 1E.

When she entered the hospital she was emaciated and the joints were almost completely ankylosed in the position shown in Illustration A. The jaw could be opened three-fourths of an inch, the spine was stiff, and the ribs ankylosed. The knees were subluxed and there was a great amount of tibial torsion.

After a course of triple typhoid injections, physical therapy was started on December twenty-sixth, consisting of heat, massage and active motion. The feet were placed on sliding boards (Illus. B) without the sandbags. In this way, she was able to actively flex and extend the knees within her very limited range of motion. After this exercise, the sandbags (starting with ten pounds and increasing to twenty-five) were placed on the knees to force them into the greatest amount of extension possible before they were bound into posterior leg splints each day.

In order to gain hip abduction, small square play

The Shriners' Hospitals for Crippled Children, Twin Cities Unit, Minn.

blocks were forced between the legs, just above the knees. Half blocks were used to make the increase each day more gradual. It is felt that this pressure just above the knees, with none below, might have been instrumental in decreasing the tibial torsion. An attempt was made to force the hands and elbows but this was very painful and little was gained. The patient was given moulding clay for active hand exercises.

Fig. 2A.

Fig. 2B.

On August seventeenth, 1934, posterior capsulotomies and lengthening of the heel cords, with application of plaster dressings, were done. Hand splints were made which held the wrists in as much extension as possible. The plaster was removed on September twenty-fifth and physical therapy was resumed.

On November twenty-seventh tank exercises were started. The overhead pulley was used, the belt fastened to hold the child in backlying position (Illus. E), and the rope was fastened at the proper height so that she could swim without assistance. In this position, she was able to kick vigorously and use the arms and legs to quite an extent. She was allowed to swim in this manner from one to one and one-half hours in a temperature of water at ninety degrees.

Through vigorous kicking and splashing in the water, and the use of arms, legs, trunk and head muscles, the muscle tone was improved. Breathing was increased when the patient, in trying to break the record of the day before for the number of swims up and down the pool in a certain length of time, was able to exercise to the limit of her endurance. The ribs which were almost completely ankylosed upon admission to the hospital were freed through this increase in breathing.

In January, 1935, she started to walk in the walker. Alpine lamp was given (Illus. C) and she had sun treatments during the summer. The flexion deformity of the wrist was corrected in an operation in which the wrist was ankylosed in a position of slight hyperextension. She started walking with crutches in October and was discharged in November. (Illus. D).

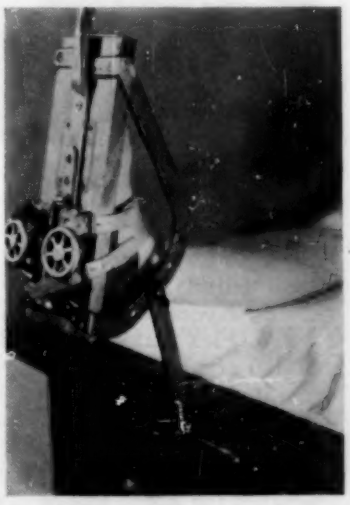

Fig. 4.

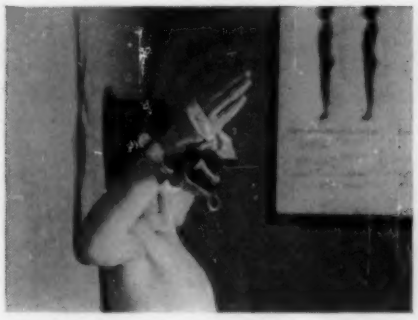

Fig. 2C.

Fig. 2D.

Her general condition was excellent, she had gained forty-three pounds and her flesh was firm and brown. There were no signs of active arthritis. The knees were markedly stiffened and allowed very little motion, but they were in a straight position. The subluxation and tibial torsion deformities were greatly decreased. She was able to walk with crutches and could sit with ease. During her treatments, she experienced very little pain as most of the exercises were active with very little forcing of sensitive joints. She writes that she is carrying on her exercises at home, washes dishes for her mother and trying to help make cakes.

Obstetrical Paralysis

The figure 2 group represents an obstetrical paralysis case which was admitted to the hospital in February, 1927, with a history of difficult birth. An aeroplane splint had been applied when the child was three months old but was removed because he cried so much. There was no further treatment until he came to the hospital at the age of five.

The shoulder was definitely contracted and could not be abducted, or externally rotated. The pectoralis major was very tight, and the forearm was slightly pronated, but there was excellent use of the hand. An attempt was made in physical therapy to stretch the muscles of the shoulder to overcome adduction and internal rotation. The mother was instructed in home treatment and the child discharged, wearing an abduction splint.

He was re-admitted on August thirteenth, 1935 (Illus. A) for operative procedure. In this, the pectoralis major and sub-scapularis muscles were divided and the arm brought into marked external rotation and abduction. The plaster of Paris dressing, which was applied after the operation, was removed on September

Fig. 5.

Fig. 3A.

Fig. 3B.

tenth and physical therapy was started. The bivalved plaster was worn as a splint when child was not having exercises. The exercises were directed toward increasing abduction and external rotation. They were given in back-lying position at first, with a slight amount of resistance. As he gained strength the exercises were given at the wall in standing position. Later, standing at the wall, a weight of ten ounces was tied to the wrist, and by October tenth the arm could be actively externally rotated from the forward position to complete external rotation, with a weight of twenty-two ounces tied to the wrist (Illus. C).

Fig. 3C.

The punching-bag exercise (Illus. D) was used, with the patient in back-lying position. When the plaster was first off, this exercise was a matter of simply pushing the arm up to touch the ball but as strength was gained it became forceful punching. The difficulties of finding a vigorous exercise for external rotation and abduction are overcome in the use of a punching-bag exercise. The ball in the illustration is on a standard, but the apparatus may be made at home by stretching a rope from the ceiling to a heavy stone weight on the floor and stringing on it any large, inexpensive play ball. The ball may be held at the proper height for back-lying position on a table or bed by pushing a peg through the rope just under the ball at any height.

Fig. 3D.

Fig. 3E.

Fig. 3F.

Fig. 3G.

CONGENITAL DISLOCATION OF THE HIPS

In these cases, of which Illustration A and B art typical of before and after reduction, the patient is held in a plaster about three to six months, after which time the plaster is removed and the patient placed on a frame for about two weeks. Table exercises are then started in physical therapy, consisting of heat, massage and active exercises. The following exercises are helpful:

Back-lying position—1. With the thigh approaching as nearly as possible the position of 45 degrees of abduction and 45 degrees of flexion, flex and extend the knee.

2. With the thigh in the same position, knee straight, rotate the toes inward and outward.

Face-lying position — 3. Flex and extend the knee.

4. With knees flexed, move the thigh in abduction and adduction; child to make special effort to contract both buttocks muscles, and then relax them.

5. Knees flexed, lift thigh backward.

6. Flex knees and while maintaining this knee flexion separate the heels, swinging the legs in and out, rotating the thighs inward and outward. After a time, resistance may be given in this exercise.

7. Do exercise 6 with thighs placed in various positions of abduction and adduction. A sandbag placed between the knees will help to keep them apart.

(*Continued on page* 19)

Exercises for Spastic Paralysis

Gladys Wilson

Spastic paralysis is a condition in which the disabling factor is too much tone or too much tension in certain muscles or muscle groups. To relieve this condition, the object is to relax the tension and then teach the opposite group to function normally. Any method found to teach voluntary relaxation to the over-tight muscles would be wholly in keeping with the treatment of spastic paralysis. The nerve centers that control the normal balance of power between muscle groups have been impaired and new cell groups will have to be educated to perform this action. Therefore, the voluntary attempts of the child will be very slow and tedious, and one must be patient in accomplishing the result.

To secure the cooperation and interest of the physically handicapped child, it is well to explain in terms comprehensible to him just what factors are preventing him from being like normal children and why it is desirable for him to strive for more perfection. He should understand from the start that his progress will be slow, but if he tries faithfully over a long period of time, his efforts will be amply rewarded. After the child can voluntarily relax, he will have to learn how to contract his muscles properly—not with all the power he possesses, but just enough to perform the desired movement.

The exercise period should be made as interesting as possible, but the child must know that an unlimited amount of self-discipline will be required of him if he is to make much progress. A spastic child should be kept in a quiet, calm atmosphere. He should have regular habits of eating, sleeping and resting. From one to two hours' sleep in the afternoon will do wonders in relaxing a spastic child, regardless of age. Needless to say, it is almost a necessity for the individual who works with spastic children to be calm and collected.

Before starting the treatment, be sure that the child is warm, as this in itself has a relaxing effect. A half hour exercise period at a time is sufficient. It is not necessary to give each exercise an equal portion of time. The most difficult may be stressed. Of course, if the instructor has ample amount of time at her disposal, it would be well to give two half hour periods a day, one in the morning and one in the afternoon.

Below are enumerated a list of relaxation exercises. An attempt has been made in making out this list to take into consideration every common type of spastic contraction.

Relaxation exercises consist of easy, rhythmical swinging of the contracted part, which may be passive or assistive until the child can perform the motion for himself in an easy, relaxed way. The swinging, in most instances, should be in the direction that will loosen the contraction. The limb is swung from the starting point to as far as contraction will permit, then back again, trying in every case to increase the amount of motion.

For the severely afflicted child whose every muscle seems to be in a state of rigidity, his first accomplishment will be attained when he can lie on his back fully relaxed, his arms by his side and his legs side by side with feet pointing straight up, his head and body in a straight line.*

Exercise 1. It is well to start the exercise period with a few minutes of relaxation in the back-lying position. Tell the child to let go of himself completely, as if he were sinking deep into a soft, soft bed. A pillow placed under the head and one under the knees will accentuate this feeling.

Exercise 2. For contraction of the abdominal muscles pulling the body to one side, hold the hips in place and gently swing the body in the direction opposite the contraction.

The instructor must work very slowly and rhythmically if there is considerable spasm in the abdominal muscles and will probably gain only a slight swing of the body at first; after which, she swings the body to a straight line and then beyond to an over-corrected position.

Exercise 3. Tight muscles in the neck that deviate the neck to one side may be worked with in the same way, holding the shoulders in place. Or, there may be a rotation in the neck. In this case, gently rotate the neck in the opposite direction.

Exercises for Arm and Hand Muscles

Exercise 4. Lying on back, gently swing arm from side to horizontal with shoulder, gradually increasing the motion. Make the movement easy, graceful and rhythmical.

Exercise 5. Now bend and straighten elbow, little by little until elbow has come to complete flexion and extension. Grasp the elbow in one hand while using a slow, rhythmical swinging in flexing and straightening the elbow with the other.

Exercise 6. For wrist drop: Very gradually stretch the wrist back just the least bit at first, letting it go back to the original position, then stretch back the least bit more each time and so on until you feel the tight muscles relaxing. If the muscles are very tight, the motion will have to be performed passively for a considerable length of time (months) before the child can make voluntary attempts. Have the child help with the passive motion.

Exercise 7. For supination of forearm: Most children will attempt to rotate the hand from the shoulder. To eliminate this tendency, grasp the child's elbow in one hand and grasp the hand as though you were going to shake hands with the child with the other. Hold the elbow in place and with the other hand turn the palm over, gently at first, as with pulling the wrist back. Keep the elbow close to the child's body in this exercise.

Exercise 8. In some instances the hand deviates toward the ulnar side. In this case, stretch the hand easily toward the opposite side.

Exercise 9. In thumb adduction and in finger contractions, gently stretch, as in the other exercises.

The above exercises, except arm abduction, may be done in either the lying or sitting position.

Exercise 10. Rotating the shoulder gently seems to have a more relaxing effect in the sitting position than arm abduction. Of course, this exercise will be given only when the child is able to sit.

Scottish Rite Hospital, Dallas, Texas.

*A similar set up of exercises will soon appear in a book entitled "Home Treatment of Spastic Paralysis," by Dr. P. M. Girard.

EXERCISES FOR LOWER EXTREMITIES

Exercise 11. General exercise for relaxation of hip flexion: Place one hand at waist and gradually swing leg up to position of semi-flexion. The knee may be held in a slightly flexed position in this movement.

The exercise should be entirely passive or unassisted by the child, as there is usually some contraction in the the hip flexors when the lower extremities are involved. Tell the patient to loosen his muscles and let you swing the leg up and down.

Exercise 12. You may bend and straighten the knee in the same position. In the latter mentioned exercise, place one hand under the knee and grasp the foot with the other hand. This exercise is to be done passively, too.

Exercise 13. Sometimes the adductor muscles have so much spasm that the legs cross each other and cause what is termed a scissors position. Place one hand at child's hip and grasp the child's leg with the other hand. Now, gradually abduct the leg. It may take months to get the normal amount of abduction. Sometimes, it is necessary for an assistant to hold the other leg in position. The motion will have to be performed passively at first, but encourage the child to help you with the swing from time to time. Emphasize that he help you with swinging the leg out, but "make his muscles let go" when the leg is brought back to place; otherwise, he is exercising the already tight muscles.

There is usually a marked inward rotation of the leg when the adduction spasm occurs. This is hard to explain because the adductors assist in outward rotation of the leg. But it might be that this inward rotation is caused by a spasm of the inner hamstring group which rotates the knee medially.

Exercise 14. Place one hand at the hip to steady it and the other on the inside of the knee and very gradually and gently roll the leg out. Work in the same way as in the abduction of the leg. First, secure the correction of the inward rotation and then work for over-correction. Now see if the child can hold the corrected position.

Exercise 15. Most spastic children, whether they are able to walk or not, can not hyperextend the hip with the ease of the normal child. Have the child lie on face with head on pillow, place one hand just above the hip and the other under child's knee and gently swing the hip backward. Have the child assist you in this movement.

Exercise 16. Spastic children usually have tight heel cords, which hold the foot in plantar-flexion. Place the child on his back and again place a pillow under his knees. Grasp the heel in one hand and the ball of the foot in the other and gradually dorsi-flex the foot.

Exercise 17. Occasionally one will find a foot pulled into varus deformity. In this case gradually evert the foot, as with dorsiflexion.

After these exercises have been given, have the child try to hold the body in a normal position. Suggest that he attempt to control the over-active muscles. Try to get him to feel the difference between tension and relaxation and then to control the situation voluntarily. The word relax will not mean as much to the child as "soften" or "loosen" the muscles.

When the child has learned to lie perfectly relaxed, the next step is to get him to sit. This position is a desirable one to attain, as it opens new avenues of development, both mental and physical. Stress that his weight be evenly distributed on both tuberosities of the hips; otherwise, lateral deviations of the spine may develop. It is desirable for the child to learn to sit with legs slightly apart to counteract the tendency toward adductor spasm.

Exercise 18. If the head and body seem to droop forward, grasp the body firmly with both hands and tell the child to push up easily. This may have to be done over and over again to get the child to sit in an erect position. Of course, the child can not be expected to sit by himself the first several times, but keep on trying and in all probability one day he will do so. Now a new interest will be added for the exercise period, because the child can take many of the same exercises in a new position.

Exercise 19. A very good exercise for general relaxation of the lower limb is slow, rhythmical swinging of the lower leg in sitting position. Have the child sit with legs hanging from table. Place one hand on knee, holding it to table and grasp the ankle with the other hand. Now, gently swing leg back and forth. Be sure that the heel is swung in, almost touching the other heel each time.

Exercise 20. In leg abduction the child may sit with knees hanging from table. Hold one leg in place and place the other leg apart. Let the instructor take the leg back to position in each instance.

Exercise 21. The dorsiflexion of foot exercise may be taken in this position. Emphasize that he must not put any effort into plantar flexion. Just pull the foot up as much as he can and then let the foot go. Otherwise, he will be exercising the already tight gastrocnemius. The child may be placed on a stool or box low enough so that his feet are flat on the floor. Tell him to keep his heel on the floor and try to pull the forefoot up.

EXERCISES IN STANDING

When the child is able to sit comfortably and relaxed, the next step is to get him to stand alone. Place him on the floor with heels flat and legs slightly apart. In most cases it helps to hold the knees and hips slightly flexed. Hold him in position, giving plenty of assistance and tell him to try to "loosen" all of his muscles. It may give the child confidence to stand near an object that he can grasp. The instructor should not withdraw support from the child during the first experiments in standing. And at first just barely draw hands away from child, probably touching some part of his garment to give him assurance.

When he is able to stand alone, he may start taking a step or two with the assistance of the instructor. Encourage an easy, relaxed swing from the hip.

A small roller stool about eleven and one-half inches in height is a very necessary article in teaching spastic children to walk. With this, the instructor can roll along beside the child, steadying him in the walking exercise, or without undue strain on herself she can stoop to place his feet correctly on the floor when the child is in the habit of walking in equinus or equinovarus position.

Needless to say, the spastic child will have to be cautioned constantly to slow down, for he delights in going at top notch speed most of the time, and very often he will need more than just being cautioned.

The above exercises are probably already well known to most physical therapists. However, judging from the many phases of the work with which I am not thoroughly familiar, I thought the above suggestions might prove helpful to some.

Physical Therapy in Peripheral Nerve Surgery

P. M. Girard, M. D., F. A. C. S.

If a freshly cut nerve is in a fairly clean area, it is usually sutured with fine silk, and in a large percentage of cases there is complete recovery. However, if such an injured nerve trunk be in a badly soiled area, the repair is done with fine chromic catgut. The expectancy in this case is that the nerve ends will be kept together and not retract. Growth of the axones through this sort of an infected area does not frequently occur. About three months after the infection is healed, a repair using fine silk has to be done.

In any nerve injury in which the skin is not broken, such cases as bruising or damage to nerve trunks by the fragments of fractured bones, a period of three months should be allowed for recovery. If after this time no signs of recovery are seen, exploratory operation with repair or freeing of the nerve trunk from the scar should be done. Good regeneration may be expected even after a year. However, no regeneration should be expected after two and one-half to three years.

In cases of long duration, the nerve ends should be located and all the neuroma excised from the nerve trunk, cutting back on the trunk until normal nerve bundles are seen. This is sometimes an alarming procedure because upon each excision the distance between the ends becomes greater. If the trunks are not cut back sufficiently far to show normal nerve bundles, suturing the ends together will be of no avail. It is, therefore, good practice first to prune properly the nerve ends and then worry about getting the ends together. The shortened ends must be brought together in an end to end manner for good results. Also, it is important in mixed nerves (those carrying motor and sensory fibers) that the proper rotation of the two ends be maintained; otherwise, a sensory area will be sutured to a motor area and no results will be obtained. In retracted or shortened nerve ends the ends may be made to meet by changing joint positions to lessen the distance or by transplanting the trunks.

When joint position is used to permit end to end suture, this joint position should be maintained three weeks. At this three week period time, it is proper to begin physical therapy. Infra-red baking with gentle massage may be started to improve the circulation in the extremity. Care should be exercised to maintain the same joint position, as excessive stretching may tear the sutured nerve ends apart. At this period a gradual releasing of the joint is done each day for another week, then it is released from all fixation except proper splinting to the hand or foot—a cock-up wrist splint or a drop foot brace. The patient is told to work the limb gradually out, always stopping within the limits of pain.

At the same time the heat treatments are started. Faradic coil stimulation may be done over the entire limb in order to maintain muscle tone over those muscles from which contractions can be obtained. The Morton-Smart machine has been found particularly valuable for this type of work. Coil stimulation is particularly valuable when the nerve function begins to return, as it definitely decreases the time required for regaining full muscle power.

The early sign of returning nerve function is Tinnell's sign, which is a tingling sensation over the area supplied by the injured trunk when the proximal end of the nerve is tapped upon with the finger. There is also frequently an itching or crawling sensation in the limb distal to the injury. These are very favorable signs.

Nerves regenerate faster the nearer to the periphery the injury is. An average rate of growth may be estimated as one inch per month. With this in mind, it is possible to estimate to the patient approximately how many months he must wait before he should begin to look for normal return of function. This explanation to patients frequently helps to keep them from becoming impatient.

Dallas, Texas.

The Treatment of Scoliosis

Ike Kendrick, M. D.

In the treatment of scoliosis, the ultimate result, good or bad, is established on the bases:

1. Is the back well balanced and serviceable?
2. Is the deformity stationary?
3. Is the cosmetic result good?

Nothing original is to be presented, only the application of already satisfactory methods and a slight modification to the turnbuckle jacket, as described by Brewster.[1]

The difficulty in correcting the curved spine was pointed out by Lovett. To move the curve en bloc is done with more ease than to correct it. Steindler,[2] using this fact as a basis, has shown that very good results can be obtained by the development of compensatory curves. To hold the compensated back, an adequate musculature must be developed through the use of directed muscle training, and general elements of good posture must be taught.

In the well balanced back there is a proportion between the primary and the compensatory curve, the resultant of which places the head, shoulders and thorax over the pelvis. In the poorly balanced back, there is a disproportion between these curves, and one must be increased or the other decreased in order to obtain a desired balance. From the standpoint of the cosmetic result, the less acute the curves are when the back has become balanced, the less the deformity and the more normal is the proportion between the length of the trunk and the extremities. From the mechanical standpoint, it seems that, with the musculature equal, the nearly

From the service of Dr. W. B. Carrell, Texas Scottish Rite Hospital for Crippled Children, Dallas.

straight back would be more likely to hold and would in the end be more serviceable and better in appearance.

The case to be discussed and illustrated presents the method and describes the use of the double turnbuckle jacket. The shifting exercises and posture instructions were given under the direction of the physical therapy department. The jacket was made on a trimmed torso after the method described by Brewster.

The patient was a short-waisted, stocky girl of thirteen years, with a moderate right dorsal, left lumbar scoliosis. The back showed moderate deformity and poor balance. The etiology of the scoliosis was indefinite, but an illness at the age of seven years was thought possibly to have been poliomyelitis. The x-rays showed no bony changes to account for the deformity. The supporting muscles were of good strength, but of only fair tone.

Because of the deformity the dorsal curve was attacked. Work was begun in the physical therapy department and a turnbuckle jacket was made, placing the hinge opposite the ninth dorsal vertebra and at the apex of the dorsal curve. Correction was proceeded with gradually and the dorsal curve seemed to open up, but a proportion between the curves seemed not to develop and the right hip became progressively more prominent.

It was decided to apply a corrective force to the lumbar curve. This was done by cutting the jacket again and placing another hinge at the apex of the lumbar curve, opposite the third lumbar vertebra. The lumbar curve decreased and a balance was soon obtained, with marked improvement in the balance and appearance of the back.

The single turnbuckle has been used in a number of cases with very good results. The double turnbuckle has been used in a fewer number of cases, but with equally good results in the selected cases. Just as pointed out by Brewster, the turnbuckle jacket is not applicable to high dorsal curves. The primary and compensatory curves must be spaced so that the turnbuckle can be interposed.

BIBLIOGRAPHY

1. Brewster, A. H. Lateral Structural Curvature of the Spine. Archives of Surgery, XXVIII, 1427. April 1929.
2. Steindler, A., The Compensation Treatment of Scoliosis, Journal of Bone and Joint Surgery XI, 820. October 1929.

The Importance of Early Physical Therapy in Injuries to the Elbow Joint

Somers B. Sleep, M. D.

Probably no injury causes the average doctor so much concern as do those involving the elbow joint, whether it be a fracture, dislocation, sprain, or contusion. It seems that most of these injuries occur in children. Usually there is a rapid and marked swelling in the region of the joint, making examination very difficult, together with the pain and poor cooperation from such young patients.

It is very important to know the anatomical landmarks and make a thorough examination (while the patient is under a general anesthesia).

Another problem is that of roentgenogram pictures. Unless one is well informed about the roentgenological findings of the elbow joint at all stages in its development, he is very apt to overlook what is really a fracture. This is especially true in the case of children, because calcification of the epiphysis has not occurred.

Most fractures around the elbow joint after reduction are put up in the hyperflexion position with the forearm in supination or pronation, according to the location of the fracture. This maintains the fragments in place after reduction has been secured, but if continued too long, encourages limitation of the motion at the elbow joint.

The time to begin using physical therapy is still controversial among those who treat these conditions. Some start as early as the fourth or fifth day. Others wait as long as ten days or two weeks. Of course, this will vary with the type and extent of the injury and the results obtained on reduction in case of fracture.

It has been the writer's experience that the best results are obtained on those patients on whom physical therapy is begun as early as possible. It is necessary to maintain hyperflexion for such time as will allow firm enough union to eliminate the danger of displacement of the fracture.

At the proper time, the writer has found the following sequence of treatments to be of value. Beginning the latter part of the first week, gentle daily massage of the wrist, forearm, elbow, and arm is started. During the second week the arm may be removed from the splint and whirlpool treatments given. During the third week, active flexion and extension at the elbow are carried out, with the elbow well supported during these treatments. The elbow is put up in hyperflexion following each treatment, which is given daily if possible.

After the third week, providing firm union has taken place, the splint or bandage, if used, is removed and the arm carried in a sling. Following this, the treatment may be carried on in various ways, the ultimate object being to obtain a full range of motion at the elbow joint without pain. The patient is encouraged to use his arm but not to overstep the limits of fatigue or pain. He may be given a small pail to carry in which water or pebbles in increasing quantity are added daily, or he may be given a small wheelbarrow to push and to which are added small loads. These cases are thus treated until full restoration of function, or to the maximum function possible according to the extent of the injury.

One may not obtain a perfect anatomical result, but the large majority of these fractures will recover with a good functioning arm. These patients should report back for checkup over a period of several months.

Pierce County Hospital, Tacoma. Wash.

Physical Therapy in Chronic Shoulder Disabilities

W. B. Carreil, M. D., F. A. C. S.

Physical therapy measures are frequently criticized when patients do not make rapid recovery. Some shoulder disabilities are so chronic in nature, that recovery wil be very slow regardless of the treatment measures applied. When the doctor, the technician and the patient understand the underlying pathology, therapy measures will be appreciated even though the reaction is slow.

The shoulder joint, because of its anatomical arrangement designed for free motion, no weight bearing and very little articular contact, is almost entirely free from the usual arthritic changes which are so common in other joints. With the exception of certain definite diseases as tuberculosis, luetic infections and osteomyelitis, most of the disabilities in the adult shoulder result from trauma. This trauma may be a single injury as in partial or complete dislocation of the shoulder, or may be of minor character, sufficient only to lacerate or sprain some of the muscular attachments around the shoulder. Such lacerations or injuries may be complicated by mild inflammatory changes as the result of infection just as ligament and muscle attachments in the back or elsewhere are delayed in recovery by infective inflammatory changes.

The adult shoulder disabilities, therefore, may be conveniently grouped under traumatic injuries, which includes the most common type, damage to the attachments of the supra spinatus tendon or of the biceps tendon, and bursitis of the subacromial bursa which is secondary usually to injuries of the tendons of the supra spinatus. These conditions in the early stage are treated either surgically or by position of rest followed in ten days to two weeks by proper regime of physical therapy. The imposed position has usually been one of abduction and outward rotation on a splint and the first active movement should be started with the arm abducted.

Baking and massage stimulates more rapid repair by improving the circulation and should precede by a few days the starting of active motion. Forced movements of passive nature should not be done except for special indication in the treatment of joint pathology from any cause. After two or three weeks the splint is discarded and the patient is encouraged to take active movement, swinging the shoulder with the body flexed, so that a free movement is secured between the humerus and the scapula. This rotary motion permits movement without strain on the torn muscle or irritation of the injured portion against the acromion. Recovery in acute and sub-acute traumatic conditions of this type is fairly rapid.

Periarthritis, tendinitis and calcareous deposits about the bursae in the shoulder are similar in pathology and in the long period required for recovery. These conditions occur following minor traumas and are perhaps primarily a partial rupture of one of the conjoined tendons, that is, supra spinatus, with later changes influenced by degenerated and faulty metabolism. They are also influenced by low grade infection and chronic irritation from recurring trauma. In such cases the shoulder is painful in movements, especially in abduction and in rotation. The onset is gradual or may be fairly sudden, as from some minor injury. Often the injury is ascribed to some severe trauma, with freedom of several weeks before painful stiff shoulder is evidenced. These patients in the middle age group recover slowly, but finally get well, regardless of the treatment instituted.

It is in this particular type of patient, who does not understand the nature of the disability, that many methods of treatment have been used and discarded. Physical therapy is nevertheless of distinct value. In the case started fairly early, the arm can be gotten into the abducted and outwardly rotated position with heat therapy, preferably diathermy or short wave, massage and gradually increasing active movements instituted. If examined late, a manipulation will frequently break the adhesions which have formed around the shoulder, chiefly in the subacromial bursa and the arm placed in the abducted position with early therapy treatment. The physical therapy measures will not shorten appreciably the course of the disease but will certainly make the patient more comfortable during the painful stage.

Doctors too frequently regard physical therapy as merely baking and massage. These measures are truly of value but more as a preliminary measure to the real therapy which a good technician can give. The training of muscle function accomplished by the patient under direction of a competent technician is a most valuable aid in the recovery of normal joint actions.

Professor Orthopedic Surgery, Baylor University, Dallas, Tex.

(Continued from page 14)

An exercise has been added recently because of an occasional compression supra-condylar fracture of the femur, when the child begins kneeling in the crib.

Child sitting on edge of table—8. Knee extension, with weights on the foot, and leg hanging over the edge of the table.

After two weeks of table work, tank exercises are started as shown in Illustrations C, D, E, F, and G. In these exercises, the child is encouraged to do the flutter kick, with stiff knees, and to abduct and adduct the legs. Weight bearing is started at first in a walker in the tank (Illus. G). Later the patient is fitted with shoes and weight bearing is continued in a walker out of the water for about two weeks, after which time she is allowed up.

Figure 4 is a heel-cord stretcher in which the foot can be tightly strapped. At the end of the rod, a rope is fastened which the patient can pull for a time to do his own stretching. In this way he is able to relax his heel cord muscles to better advantage.

Figure 5 is an arrangement of two tables, pulley and sandbags found to be helpful in stretching a stiff hip into flexion.

The Physiotherapy Review

Editor-in-Chief: IDA MAY HAZENHYER

Assistant Editor: MARGUERITE SVEBILIUS

Business Manager: GERTRUDE BEARD

Associate Editors

MARTHA E. HINDMAN
342 Lowry Bldg., St. Paul, Minn.

SUE ROEN
2417 So. Hope St., Los Angeles, Calif.

BLANCHE B. SINN
112 E. Providence Rd., Aldan, Pa.
Clifton Heights P. O.

The Physiotherapy Review is published bi-monthly by
The American Physiotherapy Association
Editorial and Business Office,
303 E. Chicago Ave., Chicago

Vol. 16 January-February, 1936 No. 1

Fifteenth Annual Convention

June 27, 28, 29, 30, 1936

For the last two years, the Southern California Chapter has extended an invitation to the American Physiotherapy Association to hold its convention in Los Angeles, the invitation to stand until accepted. This year the convention will be held there. Headquarters will be the Ambassador Hotel, which has many special attractions: the Lido with its outdoor pools and beach; the Spanish patio, the World Famed Cocoanut Grove; acres and acres of landscaped gardens. Every comfort of a beautifully appointed hotel in the midst of a large city will be yours and yet you will feel that you are living on a large country estate. The weather in June is ideal. It is not hot and oppressive as in the midwest and east. You will enjoy being outdoors.

Mrs. Colby has a wonderful idea for the opening of the convention. She suggests a "Brag dinner" to be held in the Spanish Patio. Chapter reports will be given in true "brag" style and everyone will have an opportunity to become acquainted. It is just possible that for our formal banquet we may be able to have the famous Cocoanut Grove orchestra. There are also plans under way for a trip through a Movie Studio. As you may know, permission is difficult to obtain since the advent of the sound stages, but the committee is confident of success.

The program sessions are to be in the little theatre. The large room for exhibits, both scientific and commercial, will be next door. Now for the program itself. It is still too early to announce the speakers but the general plans can be presented. There will be a session on electro-physics and various forms of electro-therapy. An evening session will be held in the auditorium of the Orthopedic hospital. A demonstration of underwater gymnastic technics will be part of the evening program. Another session will consider the various methods of mobilizing injured joints.

Also, there are several men on the Pacific coast who have made decided contributions to the field of mental hygiene. Last year we considered "Physiotherapy in a Mental Hospital." This year the emphasis will be placed on Mental Hygiene for the average patient. The approach will be from normal to abnormal mechanisms. Another session will consist of demonstrations of posture technics. Doctors, physical therapists, and specialists in posture correction from the public schools and universities will participate in this program.

Of unusual interest will be the demonstration of posture correction through the dance. Margaret Jewell, dancing instructor at San Jose State College, will present five students who have studied with her for the last three years. Each of these students has a definite posture problem. Silhouette records of these girls for the three year period will be shown. An article on the dance and posture correction, written by Miss Jewell will appear in the next issue of THE PHYSIOTHERAPY REVIEW.

The Nurses Convention is to be held in Los Angeles the week before the American Physiotherapy Association. Why not plan to attend both? If you wish to combine a vacation with the convention, the opportunities are many: Catalina Island, the Art Colonies and beautiful beaches at Laguna and Carmel, Yosemite, Big Bear Lake, Lake Tahoe, Mexico, San Francisco with its Chinatown, the Redwood Highway to Oregon and Washington. Physiotherapy Association members on the coast will be glad to help you plan an itinerary.

If you wish to combine study with the convention, there are also opportunities. The Orthopedic Hospital in Los Angeles has a six weeks summer course in physical therapy which gives credit at the University of Southern California. Inquiry concerning this course should be made to Susan Roen. The number of students is limited, so early reservations should be made. Stanford University is offering this summer, and next summer, opportunity for properly qualified students to do a complete dissection of the human body. This course will be same as that offered to the medical students. Anyone interested in this course, please communicate with Catherine Worthingham, San Jose State College, as students are to be accepted for this course in groups of four.

The Southern California Chapter is looking forward to welcoming you to Los Angeles, June 27, 28, 29 and 30, and is planning to make your stay a memorable one.

EMMA HANSEN,
President, and Local Convention Chairman.

CATHERINE WORTHINGHAM,
National Convention Chairman.

Exhibits

Do you remember the convention at Cleveland? Then, surely, you remember the room of exhibits. There were so many of them and such interesting ones. Last year at Atlantic City, because of hotel agreements with the American Medical Association, our exhibits were limited. There were a few and we all wished for more. This year we are to have both scientific and commercial exhibits. The Ambassador hotel has arranged to let us have a large room for our exhibits which will be next door to the little theatre where the sessions are to be held. This room will be divided into two sections, one for the scientific and the other for the commercial exhibits. There will be more space than we have ever had before.

The scientific exhibits will be grouped into four different classes, (1) Individual; (2) Chapter; (3) School, Organization and Hospital; (4) and American Physiotherapy Association exhibits which have been shown before other organizations. A committee composed of members of the medical profession and our own association will award Certificates of Merit to the outstanding exhibits in the first three classifications.

There are so many things which can be worked up into interesting exhibits. Case photographs, charts, records, surveys and reports are always suitable. Models of physical therapy departments, showing the arrangement and type of equipment, make very attractive exhibits and are always centers of interest. Home made apparatus, constructive games and educational toys offer other possibilities. There is so much material available. Plan now to let the rest of us share with you that interesting case, that useful bit of apparatus that you have found to be indispensable. Very soon a letter will come to each of you with more detail about the exhibit; but decide to be an exhibitor now.

The American Physiotherapy Association will place on exhibit "Modern Technics in the Exercise Treatment of Faulty Body Mechanics" which was shown in the Educational Division of the Scientific Exhibit of the American Medical Association in 1935. This exhibit was also shown at the 1935 convention of The American Congress of Physical Therapy. If the plan of the exhibit for this year's American Medical Association scientific exhibit is accepted, it will also be presented. We also hope to have a Model Physical Therapy Library, which will be of interest to everyone.

The commercial exhibits will include the latest in physical therapy equipment, which has been approved by the Council on Physical Therapy of the American Medical Association.

Be sure to send in your reservations for space in the scientific exhibit as soon as you receive the letter from the Chairman of the Exhibits.

Mariam Van Tassel

On December the twenty-fifth, 1935, Mariam Van Tassel passed away at Galveston, Texas. The death was due to pneumonia.

Miss Van Tassel had been a member of the American Physiotherapy Association for many years, and was a valuable member from the Southwest. The Texas Chapter will miss such a member, and the entire Association will feel the loss. THE PHYSIOTHERAPY REVIEW is especially indebted to Miss Van Tassel for several contributions.

New Chapter to Be Formed

News from the Michigan Chapter announces the proposed organization of a Western Michigan Chapter. The reason for this is that it is difficult for the members from the eastern part of the state and the western to get together.

The members of the Michigan Chapter were invited to Grand Rapids on November the ninth for an "open house", with special clinics and lectures. The program committee outlined the activities for the year. Dr. Lafert agreed to give a series of five lectures on Operative Procedures.

ANNOUNCEMENT

Members of the Committee on Physical Therapy for the year 1936, as appointed by the American Hospital Association:

Christopher G. Parnell, M.D., Chairman, Rochester General Hospital, Rochester, New York.

R. H. Bishop, Jr., M.D., University Hospitals, Cleveland, Ohio.

W. R. Chenoweth, Royal Victoria Hospital, Montreal, P. Q.

John S. Coulter, M.D., Northwestern University, Chicago, Ill.

ABSTRACTS

John S. Coulter, M. D.

Facial Paralysis

Oliver P. Bourbon, M.D., Los Angeles, in Arch. Otolaryng., 22:3:285, September, 1935.

It should be determined before treatment is begun whether the paralysis is the central or peripheral type, as the treatment of the two types is radically different. Rosenheck has given a definite differentiation. In the central type the paralysis may be bilateral; if it is unilateral, only the lower half of the face is paralyzed, the upper half escaping. In the peripheral type the paralysis is always unilateral, and the entire side of the face is involved. That the upper half of the face escapes in the central type is because in this part of the face there are muscles which act bilaterally and have representation on both sides of the cortex, so that if disease affects one side, the other side continues to function. In the lower half of the face the muscles are strictly unilateral and are unilaterally represented. Bilateral facial paralysis may also occur in postdiphtheritic paralysis and when there is bilateral otitis media.

Not including those cases in which there is a complete break in the continuity of the nerve and the treatment is surgical, peripheral facial nerve fibers show a high tendency to regenerate, and the prognosis is good even in cases of long standing if the cause is removed. Uncomplicated facial paralysis caused by neuritis is a benign disease from which recovery is probable. The time of functionaral recovery varies; in some cases the condition lasts a week or two and the patient recovers spontaneously, while in cases of the more severe type the patient may never completely recover, even with the most assiduous treatment. With proper treatment the patient with a mild form usually recovers in from ten days to six weeks; in a more severe case from two to eight months is required, and in some cases there remains a permanent deformity.

It is the consensus that the treatment of facial paralysis when it is a complication of otitis media is primarily that of the aural condition. Conservative treatment is indicated as long as the disease shows a completely normal course and there are no definite symptoms of involvement of the mastoid. Morwitz, after a study of the literature and experience with many cases, concluded that when the paralysis is a complication of acute otitis the treatment is essentially that of the aural condition per se and that the paralysis is not necessarily an indication for operation.

In facial paralysis due to neuritis the treatment for the first two weeks or longer is rest and such measures as will allay the inflammation and so reduce the edema of infiltration and relieve the nerve of pressure. In this acute stage heat should be given in the form of hot compresses, radiation with infra-red rays or diathermy. The patient should be warned against "trying out" the muscles. Internally, sodium salicylate is given and antisyphilitic treatment is given syphilitic patients. In the subacute stage and in all cases of paralysis, whatever the cause, iodides should be given to absorb the infiltrate. Gentle massage may be given in this stage and a faradic current may also be carefully administered if there is no reaction of degeneration.

In the beginning the electrical responses of the muscles may remain unchanged, even though paralysis is complete. At the end of from ten days to two or three weeks the electrical reaction should be tested. The degree of electrical response may vary from a mild degree to the complete reaction of degeneration and is of value in determining approximately the length of time necessary for functional recovery. The greater the loss of reaction, the more energetic the treatment should be and the longer it should be continued. After the disease has entered the chronic stage and a loss of electrical reaction is established remedies should be given to stimulate regeneration of the nerve and to absorb any exudate that may be present. Strychnine and the iodides should both be given, and systematic massage should be instituted. Sodium salicylate, the iodides and strychnine may all be given at the same time. The patient should try voluntary exercise daily. He should stand in front of a mirror and try to smile, close the eye, lift the eyebrow and reproduce all facial movements of which a normal person is capable. The treatment by the interrupted galvanic current should now be begun and should be continued for several months if necessary.

The treatment of facial paralysis in the later stages by physical therapy is the same whether the paralysis is the result of operation or injury, is an aural complication or is the result of neuritis. Galvanism should be given in the form of the negative interrupted current, and it is the most effective treatment there is in the later stages, especially in the more severe cases. It must not be given in a haphazard manner but carefully and systematically by a special technic and, if necessary, over a long period of time. Good results can be obtained with an inexpensive instrument if it will deliver an even flow of current. The technic as described is that used with a galvanic controller, the interruptions being made with the rheostat.

An electrodiagnosis should be made before treatment is begun. The following points on each side of the face should be tested for the reaction to electrical stimulus, these being the points on the affected side to be treated:

1. A point on the temple midway between the upper part of the auricle and the eye—the motor point for a reaction of the superior branch of the nerve.
2. A point on the cheek midway between the lobe of the auricle and the tip of the nose—the motor point for a reaction of the middle branch of the nerve.
3. A point on the cheek just anterior to and below the ear, slightly below the level of the angle of the mouth—the motor point for a reaction of the inferior branch.

Technic of Galvanic Treatment

The negative electrode is a round fabric-covered electrode from ½ to 1 inch (1.2 to 2.5 cm.) in diameter. The positive electrode should be somewhat larger.

Thoroughly moisten both electrodes with a saline solution.

Place the negative electrode over one of the motor points to be tested.

Place the positive electrode on the back of the neck or on the opposite side of the face or neck.

Move the rheostat slowly forward until the meter registers a current of 3 milliamperes.

Note the point to which the rheostat must be moved to register this amount of current, then move the rheostat back to zero.

Move the rheostat somewhat more quickly forward to this point and note if a contraction of the group of muscles is produced, then move it immediately back to zero.

If there is no contraction of the muscles repeat as before, moving the rheostat a little farther each time until a contraction of the muscles is produced, moving it each time immediately back to zero. Note the milliamperage required to produce a contraction of the muscles at this point and record the amount for future reference.

Test the other motor points on the normal side and record the milliamperage required at each point to produce a contraction of the muscles.

Now test the corresponding motor points of the paralyzed side in the same manner, note the milliamperage required to produce a contraction of the paralyzed muscles at each point and record the findings.

If more than 20 milliamperes is required to produce contraction of the paralyzed muscles the interpretation is that there is a complete break in the nerve impulse to those muscles. This may mean a severed nerve or pressure on the nerve from a fragment of bone, from scar tissue or from some other pathologic change. The important fact to note in this connection is that treatment by galvanism should not be given until pressure on the nerve has been removed, if possible; then treatment may be given and be required for a long time before results are obtained.

The technic for treatment is the same as the technic for electrical diagnosis, with a few modifications.

When treatment is first begun contraction of the muscles should not be produced. Begin treatments with approximately one-half the amount of current necessary to produce a contraction.

Have the patient attempt a voluntary contraction of the muscle group that is being treated at the same time that the current is applied.

In the beginning give only a few applications of the current to each muscle group at each treatment. If too many applications are given even a retrogression of function may be noticed following the treatment.

Gradually increase the number of applications given each motor point at one treatment as the patient improves and gradually increase the amount of current given until a slight contraction of the muscle group is produced.

Make the interruption slow and wavelike, about twenty per minute. Too rapid interruptions exhaust the nerve.

Chronic Lumbo-Sacral Backache

H. Eugene Reading, M.D., New York, N. Y., in J. M. S., N. J., XXXII:7:419, July, 1935.

An arbitrary classification of etiological factors in the production of lumbo-sacral pain is used here for purposes of simplification:

1. Congenital anomalies of the lumbo-sacral region predominate in varying degrees when compared with the number of anatomically perfect lumbo-sacral regions. Therefore instability of the spine at this level can be appreciated when one bears in mind the severe stress and strain to which the lumbo-sacral level is subjected.

2. Metabolic disturbances: The average orthopedic surgeon experiences disappointing results in attempts to relieve backache in patients who come under this classification.

A thorough history and physical examination on the part of the general practitioner or internist has been of great help in formulating a successful outline of treatment. For instance, a patient with a hypothyroid condition or an adrenal insufficiency will complain of bodily fatigue, out of proportion to the day's activities. In the former type, poor muscle tone of the back can account for severe low back pain in the absence of other clinical evidence.

A contrast to this patient is the pituitary type inclined to be thick set and overweight, with lessened joint mobility, there being limited motions of the spine, especially in lateral bending.

Lastly, in the spasmophilic tendencies displayed by patients with parathyroid dysfunctions, they cannot obtain relief from muscle spasm unless specific glandular therapy is prescribed. Low back pain in this type is usually inconsistent.

3. Trauma: Back strain directed at the lumbo-sacral junction is one of the commonest of the minor back injuries, which may at first pass off after several days and leave the patient comfortable, even though he may not have had medical aid.

Arthritic changes of the articulating processes or their facets may commonly follow low back injuries, and may not be evident in the x-ray study until many months after the original onset of pain.

Spondylolisthesis, the term used for slipping forward of the fifth lumbar vertebra, may vary to a moderate extent as it presents at the sacro-vertebral angle. Many anatomists and orthopedic surgeons consider this condition to be congenital in origin and manifests itself clinically after injury or loss of tone of the back muscles. The recently coined term "prespondylolisthesis" is reserved for those cases having the potential possibilities of the fifth lumbar vertebra actually slipping forward at some future time because of anomalies of the articulating processes or their facets.

Focal infection has proven to be an outstanding etiological factor in a large percentage of patients with chronic low back pain. Muscle spasm is a predominant clinical manifestation, especially the long erector spinae group, and to a lesser extent the gluteus medius and quadratus lumborum.

After the etiological factors are considered, the treatment should first be directed at the cause of the spasm of the back muscles, the cases then being subdivided for convenience into two classes—the simple and the complex mechanical treatment:

a. The simple type in which correction of the mechanical derangement affords ready relief. It is the common practice for the patient to subconsciously have a tilt of the trunk away from the painful side. The following procedure has been successful in a good percentage of this type. With the patient lying face down on the examining table in a relaxed position, radiant heat or dry hot air is administered over the lower back for a period of one-half hour or longer. The back is then securely strapped in an over-corrected position, the adhesive strapping extending obliquely on each side from the buttocks to the lower dorsal levels. This treatment is repeated if necessary every five days depending upon the patient's tolerance to adhesive composition. Where the

tilt of the trunk is toward the painful side, such patients should rest in bed and receive some form of deep heat therapy several times a day.

b. The complex type where there is a flattening or a marked increase of the normal lumbar lordosis, or in those who do not respond to the simpler measures just described, rest in bed should be advised for at least short periods of time. Temporary relief quickly follows the application of Russell traction to one or both sides, to overcome the spasm which so commonly radiates down the thigh posteriorly in a goodly number of these patients. It is best to follow the resulting relaxation with a properly fitting plaster jacket, while the patient is standing, with the trunk bent forward at an angle of about 150 degrees.

Should conservative treatment fail to afford prolonged relief in a patient with an unstable fifth lumbar vertebra, operative fixation of the lumbo-sacral region will ultimately become necessary. Of course this would preferably apply to those in the age group between twenty and forty-five, where the patient's condition has been thoroughly studied.

Postural Deformities in Adolescence

Philip Wiles, M.S., F.R.C.S., Assistant Orthopedic Surgeon, the Middlesex Hospital; in Practitioner, CXXXV:3:318, September, 1935.

Treatment

The treatment of adolescents with postural deformities involves careful consideration of the individual case. The psychological make-up of the patient and his home conditions should be inquired into and a decision reached as to the importance of psychogenic factors. In any case of doubt, or in cases where the problem of emotional readjustment is beyond easy solution, it is advisable to obtain the assistance of a children's psychiatrist, or of a Child Guidance Clinic. Indeed, it is at times astonishing to find the improvement of posture which results from psychological treatment alone, without any special physical measures. However, in the great majority of cases physical treatment is necessary, either alone or concurrently with psychological help.

Physical treatment, as is clear from an etiological point of view, must be planned on general lines; it is of little use to treat one part of the body alone. There are available many systems of remedial exercises, most of those in vogue at the present time being derived from Scandinavian systems. However, from the remedial point of view, there is serious criticism to be made of such systems, even though they may be very efficient for the training of normal people. They are designed principally to improve the dynamic function of the muscles, and increase their power and efficiency during active contraction. Remedial treatment should entail chiefly re-education of muscles acting "statically", and of the central nervous system controlling them. The two mechanisms have to be approached in entirely different ways; it is no good expecting to alter posture merely by performing movements. What is required is to teach the patient to place the body in the correct posture and then to keep the posture during continually varying conditions. It would take longer than is here possible to go into the details of the appropriate training, but it is advisable that balance work must form its foundation so that a new coordination is acquired by which good posture is maintained whatever movement is made. And it is not sufficient if treatment stops when the patient leaves the class; it is essential to win both confidence and cooperation so that the new habits are continued during daily life.

Nicholas Andry of Paris, in 1741, in the first book written on orthopaedics (Orthopaedia—English translation, London, 1743, I, 224), said: "It is not enough that the legs and feet are free of those deformities to which we have observed they are subject; there is required besides a certain graceful manner of standing and walking upon them. . . . For this end put them under the care of the best dancing masters, and do not grudge the expense."

This still holds good today. It may be possible to adapt any system to fulfill the requirements of the treatment of postural deformities, but probably the best training at present available is along the lines of that for the classical ballet and by a dancing teacher who has also a sufficient knowledge of the deformities. For those who are fortunate enough to have sufficient sense of music to be able to benefit by it, it gives not only a good carriage but also balance, poise and grace.

Exercise and Heart Strain

G. E. Friend, M.R.C.S., L.R.C.P, Medical Officer to Christ's Hospital; Past President Medical Officers of Schools Association; in Practitioner, CXXXV: 3:265, September, 1935.

Preventive Measures

Temporary dilatation occurs in a certain number of boys usually at the start of the season, but it is, even so, comparatively infrequent, and in the writer's experience never gives rise to permanent damage. It should be very rare if runs are systematized, the boys graded according to both age and physique, and clock or stop-watch eliminated. The properly trained boy rarely strains his heart, and should not even dilate it sufficiently to cause more than temporary disturbance. Greater danger lies in boys running or playing organized or competitive games while suffering from a feverish cold, or too soon after an acute illness, especially influenza or some specific fever. The toxins of influenza, diphtheria and scarlet fever undoubtedly may for a considerable time affect the myocardium, and especial care is necessary in schools to ensure that boys who are convalescent from either of these diseases are curtailed in their athletic activity until it is reasonably certain that full recovery has taken place. This is the more necessary in the boy who is either underweight and over the average height, or in the boy who is overweight and over the average height for his age. It is the latter type of boy who is likely to be over-taxed by the house-master or house-captain for the reason that he is a fine up-standing specimen, and the fact that he is, in physique, ahead of his age, is apt to be lost sight of, even if the importance of the correlation is understood.

It is probable that the great majority of boarding schools, both for girls and boys, in which organized games and sports take a recognized place in the school routine, do, at the present day, possess an adequate system of medical supervision. Such supervision should include a thorough medical examination on entry, reinforced by a full medical interrogatory form from the parent giving the pupil's past medical history from birth. Systematic weighing and measuring of pupils, by the medical officer or at least directly under his supervision, at the beginning and end of each term, with preferably an additional weight record at mid-term. A special medical examination at the beginning of, and during training for all competitive sports. If such methods be regularly enforced, experience shows that the risk of heart strain occurring in connection with organized games and sports can definitely be reduced to the inevitable accidental minimum.

Some Observations on Ultraviolet Therapy

Robert Aitken, M.D., F.R.C.P.E., Physician in Charge, Skin Department, Royal Infirmary, Edinburgh; in Radiography, 1:9:106, September, 1935.

Some workers regularly attempt to produce redness. I must confess I have never been able to see the reason for this, in general radiation treatments at all events. If the redness is at all marked there is considerable itching and when a large area of skin is involved the itching may interfere greatly with sleep. Under these circumstances the patient is not likely to benefit much from the treatment, while in a markedly debilitated patient the scratching resulting from the itching may lead to septic infection of the skin. Fortunately it is not necessary to produce redness to obtain benefits. This is seen especially in children where remarkable improvement may take place without any redness.

Another type of case where there is no real disease is the person who has a persistent cough without any signs in the chest. Such a cough would clear up if there were a short spell of mild weather. Ordinarily this cough yields readily to radiation treatment. In fact I have known it to clear up after only three exposures, though it had persisted for six weeks before that.

A dermatologist need make no apology for beginning with some of the skin diseases which benefit from radiation treatment. First and foremost in the list stands lupus vulgaris. This was for long looked upon as incurable by many, doctors and lay people alike. This was hardly correct even before light treatment was introduced but nowadays the outlook for sufferers of this disease is entirely changed. General light baths and painting of the affected parts with caustics will bring about a cure in a large number of cases, though not in a few weeks.

Another skin disease which, in many cases, benefits greatly is alopecia areata. I do not believe that this therapy is a specific for this disease, as some non-dermatological writers claim. I was using this treatment for alopecia areata in 1913 and have treated many cases since then.

Recurrent boils are, in my opinion, best treated with ultraviolet rays. Not infrequently I have found that three or four weeks' treatment will suffice to stop the occurrence of the boils though previous to treatment they had been coming out at intervals for years.

All forms of tuberculous disease can be treated with success.

The type of case which does best is that in which there is periadenitis with all the glands matted together and immobile on the deeper tissues. Such glands not infrequently show a diminution in size within a week while one of the most striking features in the treatment is the way in which the patient's general condition improves.

Vascular Massage—Its Technique and Use

H. Jordan, M.D., New York, in J. Bone and Joint Surg., XVII:4:1021, October, 1935.

At the meeting of the German Orthopaedic Society in Prague, in September, 1928, Schede and Bettman suggested new ideas about the use of a tourniquet or a similar device for the treatment of various circulatory disturbances of the extremities. As the treatment by this so-called "vascular massage" has proved to be quite satisfactory in the author's experience of about six years, he believes that a report of the method may be of value and that the introduction of this treatment should be encouraged.

The technique employed in vascular massage is based upon Bier's principles of hyperaemia. The removal of the tourniquet or the Esmarch bandage is followed by an extreme hyperaemia, due mainly to the effect of aspiration or suction of the smallest vessels and capillaries and the "hunger of the tissues for blood."

According to Elbecke (following Bettman), the capillaries dilate during the bloodless state because of either the want of oxygen or the accumulation of the waste products of metabolism. Schede and Bettman state that the mechanical principle of this treatment is based upon the stimulation of the failing circulation and resorption by means of rhythmic interruption and opening of the arterial blood stream. The sluggishness of blood circulation and metabolism is overcome. From the improved vascular reaction, there results an accelerated exchange of anabolic and catabolic substances. The rhythmic change in the contents of the blood vessels, fluctuating on both sides above and below the normal limits, increases influx on the arterial side; on the venous side, the relaxed tissue of the walls of dilated veins is stimulated, thereby gaining in strength and elasticity. By increasing the blood circulation and metabolism of all the tissues of the section of the limb under treatment, the nutrition of the muscles and bones is also improved, and congestion or swelling disappears.

The field of application of vascular massage is wide. Having in mind the contra-indications to be discussed later, the author wishes to mention the following indications:

A. Lower Extremities:

1. Symptoms of fatigue of the muscles after exertion in work or sports; cramps of the calf muscles; burning of the soles.
2. Signs of congestion in the leg and foot.
3. Varicose veins of mild or moderate degree.
4. Ulcers of the leg and poorly healing wounds after trauma.
5. Painful, stiff, spastic flat feet.
6. Hematomata following sprains and contusions of the feet, etc.
7. Fractures, especially:
   a. To stimulate callus-formation.
   b. To avoid decalcification.
8. Post-traumatic atrophy of the bone (Sudek) with and without demonstrable fracture.
9. Pain due to poor circulation in amputation stumps.
10. Poor circulation of the skin and doughy induration of the subcutaneous tissue; puffiness at the ankles; thickening of the lower third of the legs, frequently seen in young females; after-effects of poliomyelitis, with susceptibility to frost; preventive treatment of frost-bite and chilblains.

B. Upper Extremities:

In the case of the upper extremities, the field of application is similar, although naturally more restricted. Besides signs of congestion from various causes, including all kinds of results from injuries, there must be mentioned, above all, painful amputation stumps, Raynaud's disease and similar diseases and, finally, the peculiar painful conditions and paresthesia in women before and during the menopause.

To the contraindications belong: poor general condition, advanced arteriosclerosis and inflammations of all kinds, especially infections of the extremity to be treated. An absolute contraindication is given by thrombosis and thrombophlebitis. Naturally, until solid union has taken place, fixation of a fracture should never be interrupted in order to use vascular massage.

tilt of the trunk is toward the painful side, such patients should rest in bed and receive some form of deep heat therapy several times a day.

b. The complex type where there is a flattening or a marked increase of the normal lumbar lordosis, or in those who do not respond to the simpler measures just described, rest in bed should be advised for at least short periods of time. Temporary relief quickly follows the application of Russell traction to one or both sides, to overcome the spasm which so commonly radiates down the thigh posteriorly in a goodly number of these patients. It is best to follow the resulting relaxation with a properly fitting plaster jacket, while the patient is standing, with the trunk bent forward at an angle of about 150 degrees.

Should conservative treatment fail to afford prolonged relief in a patient with an unstable fifth lumbar vertebra, operative fixation of the lumbo-sacral region will ultimately become necessary. Of course this would preferably apply to those in the age group between twenty and forty-five, where the patient's condition has been thoroughly studied.

Postural Deformities in Adolescence

Philip Wiles, M.S., F.R.C.S., Assistant Orthopedic Surgeon, the Middlesex Hospital; in Practitioner, CXXXV:3:318, September, 1935.

Treatment

The treatment of adolescents with postural deformities involves careful consideration of the individual case. The psychological make-up of the patient and his home conditions should be inquired into and a decision reached as to the importance of psychogenic factors. In any case of doubt, or in cases where the problem of emotional readjustment is beyond easy solution, it is advisable to obtain the assistance of a children's psychiatrist, or of a Child Guidance Clinic. Indeed, it is at times astonishing to find the improvement of posture which results from psychological treatment alone, without any special physical measures. However, in the great majority of cases physical treatment is necessary, either alone or concurrently with psychological help.

Physical treatment, as is clear from an etiological point of view, must be planned on general lines; it is of little use to treat one part of the body alone. There are available many systems of remedial exercises, most of those in vogue at the present time being derived from Scandinavian systems. However, from the remedial point of view, there is serious criticism to be made of such systems, even though they may be very efficient for the training of normal people. They are designed principally to improve the dynamic function of the muscles, and increase their power and efficiency during active contraction. Remedial treatment should entail chiefly re-education of muscles acting "statically", and of the central nervous system controlling them. The two mechanisms have to be approached in entirely different ways; it is no good expecting to alter posture merely by performing movements. What is required is to teach the patient to place the body in the correct posture and then to keep the posture during continually varying conditions. It would take longer than is here possible to go into the details of the appropriate training, but it is advisable that balance work must form its foundation so that a new coordination is acquired by which good posture is maintained whatever movement is made. And it is not sufficient if treatment stops when the patient leaves the class; it is essential to win both confidence and cooperation so that the new habits are continued during daily life.

Nicholas Andry of Paris, in 1741, in the first book written on orthopaedics (Orthopaedia—English translation, London, 1743, I, 224), said: "It is not enough that the legs and feet are free of those deformities to which we have observed they are subject; there is required besides a certain graceful manner of standing and walking upon them. . . . For this end put them under the care of the best dancing masters, and do not grudge the expense."

This still holds good today. It may be possible to adapt any system to fulfill the requirements of the treatment of postural deformities, but probably the best training at present available is along the lines of that for the classical ballet and by a dancing teacher who has also a sufficient knowledge of the deformities. For those who are fortunate enough to have sufficient sense of music to be able to benefit by it, it gives not only a good carriage but also balance, poise and grace.

Exercise and Heart Strain

G. E. Friend, M.R.C.S., L.R.C.P, Medical Officer to Christ's Hospital; Past President Medical Officers of Schools Association; in Practitioner, CXXXV: 3:265, September, 1935.

Preventive Measures

Temporary dilatation occurs in a certain number of boys usually at the start of the season, but it is, even so, comparatively infrequent, and in the writer's experience never gives rise to permanent damage. It should be very rare if runs are systematized, the boys graded according to both age and physique, and clock or stop-watch eliminated. The properly trained boy rarely strains his heart, and should not even dilate it sufficiently to cause more than temporary disturbance. Greater danger lies in boys running or playing organized or competitive games while suffering from a feverish cold, or top soon after an acute illness, especially influenza or some specific fever. The toxins of influenza, diphtheria and scarlet fever undoubtedly may for a considerable time affect the myocardium, and especial care is necessary in schools to ensure that boys who are convalescent from either of these diseases are curtailed in their athletic activity until it is reasonably certain that full recovery has taken place. This is the more necessary in the boy who is either underweight and over the average height, or in the boy who is overweight and over the average height for his age. It is the latter type of boy who is likely to be over-taxed by the house-master or house-captain for the reason that he is a fine up-standing specimen, and the fact that he is, in physique, ahead of his age, is apt to be lost sight of, even if the importance of the correlation is understood.

It is probable that the great majority of boarding schools, both for girls and boys, in which organized games and sports take a recognized place in the school routine, do, at the present day, possess an adequate system of medical supervision. Such supervision should include a thorough medical examination on entry, reinforced by a full medical interrogatory form from the parent giving the pupil's past medical history from birth. Systematic weighing and measuring of pupils, by the medical officer or at least directly under his supervision, at the beginning and end of each term, with preferably an additional weight record at mid-term. A special medical examination at the beginning of, and during training for all competitive sports. If such methods be regularly enforced, experience shows that the risk of heart strain occurring in connection with organized games and sports can definitely be reduced to the inevitable accidental minimum.

Some Observations on Ultraviolet Therapy

Robert Aitken, M.D., F.R.C.P.E., Physician in Charge, Skin Department, Royal Infirmary, Edinburgh; in Radiography, 1:9:106, September, 1935.

Some workers regularly attempt to produce redness. I must confess I have never been able to see the reason for this, in general radiation treatments at all events. If the redness is at all marked there is considerable itching and when a large area of skin is involved the itching may interfere greatly with sleep. Under these circumstances the patient is not likely to benefit much from the treatment, while in a markedly debilitated patient the scratching resulting from the itching may lead to septic infection of the skin. Fortunately it is not necessary to produce redness to obtain benefits. This is seen especially in children where remarkable improvement may take place without any redness.

Another type of case where there is no real disease is the person who has a persistent cough without any signs in the chest. Such a cough would clear up if there were a short spell of mild weather. Ordinarily this cough yields readily to radiation treatment. In fact I have known it to clear up after only three exposures, though it had persisted for six weeks before that.

A dermatologist need make no apology for beginning with some of the skin diseases which benefit from radiation treatment. First and foremost in the list stands lupus vulgaris. This was for long looked upon as incurable by many, doctors and lay people alike. This was hardly correct even before light treatment was introduced but nowadays the outlook for sufferers of this disease is entirely changed. General light baths and painting of the affected parts with caustics will bring about a cure in a large number of cases, though not in a few weeks.

Another skin disease which, in many cases, benefits greatly is alopecia areata. I do not believe that this therapy is a specific for this disease, as some non-dermatological writers claim. I was using this treatment for alopecia areata in 1913 and have treated many cases since then.

Recurrent boils are, in my opinion, best treated with ultraviolet rays. Not infrequently I have found that three or four weeks' treatment will suffice to stop the occurrence of the boils though previous to treatment they had been coming out at intervals for years.

All forms of tuberculous disease can be treated with success.

The type of case which does best is that in which there is periadenitis with all the glands matted together and immobile on the deeper tissues. Such glands not infrequently show a diminution in size within a week while one of the most striking features in the treatment is the way in which the patient's general condition improves.

Vascular Massage—Its Technique and Use

H. Jordan, M.D., New York, in J. Bone and Joint Surg., XVII:4:1021, October, 1935.

At the meeting of the German Orthopaedic Society in Prague, in September, 1928, Schede and Bettman suggested new ideas about the use of a tourniquet or a similar device for the treatment of various circulatory disturbances of the extremities. As the treatment by this so-called "vascular massage" has proved to be quite satisfactory in the author's experience of about six years, he believes that a report of the method may be of value and that the introduction of this treatment should be encouraged.

The technique employed in vascular massage is based upon Bier's principles of hyperaemia. The removal of the tourniquet or the Esmarch bandage is followed by an extreme hyperaemia, due mainly to the effect of aspiration or suction of the smallest vessels and capillaries and the "hunger of the tissues for blood."

According to Elbecke (following Bettman), the capillaries dilate during the bloodless state because of either the want of oxygen or the accumulation of the waste products of metabolism. Schede and Bettman state that the mechanical principle of this treatment is based upon the stimulation of the failing circulation and resorption by means of rhythmic interruption and opening of the arterial blood stream. The sluggishness of blood circulation and metabolism is overcome. From the improved vascular reaction, there results an accelerated exchange of anabolic and catabolic substances. The rhythmic change in the contents of the blood vessels, fluctuating on both sides above and below the normal limits, increases influx on the arterial side; on the venous side, the relaxed tissue of the walls of dilated veins is stimulated, thereby gaining in strength and elasticity. By increasing the blood circulation and metabolism of all the tissues of the section of the limb under treatment, the nutrition of the muscles and bones is also improved, and congestion or swelling disappears.

The field of application of vascular massage is wide. Having in mind the contra-indications to be discussed later, the author wishes to mention the following indications:

A. Lower Extremities:

1. Symptoms of fatigue of the muscles after exertion in work or sports; cramps of the calf muscles; burning of the soles.
2. Signs of congestion in the leg and foot.
3. Varicose veins of mild or moderate degree.
4. Ulcers of the leg and poorly healing wounds after trauma.
5. Painful, stiff, spastic flat feet.
6. Hematomata following sprains and contusions of the feet, etc.
7. Fractures, especially:
   a. To stimulate callus-formation.
   b. To avoid decalcification.
8. Post-traumatic atrophy of the bone (Sudek) with and without demonstrable fracture.
9. Pain due to poor circulation in amputation stumps.
10. Poor circulation of the skin and doughy induration of the subcutaneous tissue; puffiness at the ankles; thickening of the lower third of the legs, frequently seen in young females; after-effects of poliomyelitis, with susceptibility to frost; preventive treatment of frost-bite and chilblains.

B. Upper Extremities:

In the case of the upper extremities, the field of application is similar, although naturally more restricted. Besides signs of congestion from various causes, including all kinds of results from injuries, there must be mentioned, above all, painful amputation stumps, Raynaud's disease and similar diseases and, finally, the peculiar painful conditions and paresthesia in women before and during the menopause.

To the contraindications belong: poor general condition, advanced arteriosclerosis and inflammations of all kinds, especially infections of the extremity to be treated. An absolute contraindication is given by thrombosis and thrombophlebitis. Naturally, until solid union has taken place, fixation of a fracture should never be interrupted in order to use vascular massage.

Short Wave Therapy in Acute Inflammations About the Head and Neck

M. H. Cottle, M.D., Chicago, in Ill. M. J., 68:4:354, October, 1935.

Indications for Diathermy and Radiathermy.—The superiority of diathermy over other heating elements led to its extensive utilization in chronic conditions. Most clinicians feared to apply it in locked-in acute suppurations, although such limitation has never been demonstrated to be scientifically or clinically sound. This contraindication, however, has been so thoroughly impressed upon those working in physical therapy that few have attempted to deviate from the rule. In the treatment of acute nasal accessory sinus disease, for example, diathermy is of definite benefit in relieving pain and retarding the progess of the infection, as those who have had experience in this work will confirm. As regards radiathermy, it may be used to combat diseases heretofore treated by diathermy and, in addition, all types of acute suppuration. These include abscesses, furuncles, carbuncles and phlegmons involving the skin or mucous membrane.

Advantages of short wave therapy over diathermy in ophthalmology and in otolaryngology can be attributed to the greater facility of application. There is obviated the difficulty of close electrode approximation to the part, a factor which with diathermy frequently contributes to great discomfort and occasionally to skin burns.

Those who are interested in the various phases of this subject, especially technic, should refer to a recent article by Kobak, of Chicago, who first suggested the term radiathermy as most appropriately descriptive of this newer therapeutic agent.

The following statements are accepted as true:

Short wave apparatus can produce heat in the body or parts of the body when the current traverses the part.

Electrical contact such as used in ordinary diathermy is not only unnecessary but undesirable.

The heat produced can be localized by the proper selection and placing of electrodes.

With proper technique, treatments can be given with reasonable safety.

My own observations based on an extensive clinical study, not only substantiate these statements but also establish that:

(a) Short wave diathermy is especially well suited for the therapeutic application of heat to the head and neck.

(b) It will materially shorten the treatment period as compared with the time required by other heating agents.

Comment on Clinical Studies. As a result of my brief experience with radiathermy or short waves in ophthalmologic and otolaryngolocis practice, I have made certain deductions:

The arrangement of electrodes in condenser field treatment renders possible a localized depth effect of heat, irrespective of the intervening structures; for example, the bones of the skull, since an intense effect can be produced in the bones themselves.

Short wave diathermy is a convenient method of deep heat application, especially in acute infections, and lends itself ideally to parts about the head and neck without some of the disadvantages of other heating agents, including diathermy.

In all cases where other heat-producing agents are indicated and therapeutically beneficial, radiathermy will bring about results in a shorter period of time.

In acute suppurations which eventually must be managed by incision and drainage, radiathermy will hasten the period when surgical treatment can be instituted.

A knowledge of correct application of radiathermy, its indications and limitations, are quite essential to safety and successful results.

The Recovery of Function in the Hand in Chronic Arthritis

John G. Kuhns, M.D., Boston (From the Robert B. Brigham Hospital, Boston); in J. Bone and Joint Surg., XVII:4:939, October, 1935.

Dysfunction in the hand from chronic arthritis usually begins insidiously and at times continues after arthritis is apparently quiescent. The institution of adequate therapy in the early stages of the disease makes it possible to conserve function and to prevent deformity; and prevention is an infinitely easier task than the correction of such deformity as shown in Fig. 1. For the sake of convenience, treatment for the rehabilitation of the arthritic hand may be divided into three stages, depending upon the severity of the disease and the amount of deformity present.

The early stage of treatment is limited to those hands in which deformity is sufficient to hamper function, but can be corrected passively. Here the problem remains chiefly the prevention of deformity. There are certain principles to be kept in mind. Use of the hand should be confined to the things which the patient can do without pain. Rest in the position least likely to cause pain and contracture—about 30 degrees of dorsiflexion of the wrist, with normal contour of the palmar arches, and with the fingers in full extension—should be given when the hand is not in use. Heat, graded exercises, and occupational therapy do much to improve function.

When the deformity can no longer be corrected passively, the second stage of therapy is reached. To the procedures mentioned are added more forceful measures to correct the deformity. Plaster casts are applied with as much correction of the deformity as can be obtained; these casts are changed when additional correction is possible. In the case of more resistant deformity, traction with adhesive plaster is helpful and, when properly applied, is not particularly uncomfortable. When progressive correction does not occur and when the roentgenograms show no bony ankylosis nor marked osseous deformation, manipulation may be undertaken to correct the deformity. After manipulation, the hand is splinted in the corrected position and kept immobilized for several days, after which heat and exercises are again used. Repeated manipulations are sometimes necessary. They are undertaken, however, only after the reaction from the previous manipulation has subsided and the patient is able to move the joint actively through the corrected range of motion. Manipulation should rarely be undertaken unless the disease has been quiescent for at least a year.

The surgical correction of fixed deformities may be considered the third stage of treatment.

Book Reviews

THE AUTONOMIC NERVOUS SYSTEM, By Albert Kuntz, Ph.D., M.D., Professor of Micro-anatomy in St. Louis University School of Medicine, St. Louis, Mo., Second Edition, Cloth. Price $7.50, pp. 697 with 73 illustrations. Philadelphia, Lea & Feliger, 1934.

Kuntz's *Autonomic Nervous System* has been for a long time an outstanding English text on the subject. In this new edition, the author has included the results of recent investigations, particularly in the experimental and clinical fields, and as a consequence has enhanced its worth as a reference text.

The first few chapters deal with the morphology, development, and general physiology of the autonomic nervous system. This complex subject matter is presented in a manner which is most readable and is made particularly interesting by the inclusion of many historical references. The innervation of the various systems of organs, the heart and blood vessels, the respiratory system, digestive tube, urinary and sex organs, etc., is taken up next in order. A chapter on the autonomic innervation of skeletal muscle will be of special interest to the physical therapist. The possible role of the autonomic nervous system in the maintenance of both the "tonic" and "trophic" state of muscle is still a very controversial subject. Its present status is given ample discussion by the author.

The chapter on visceral sensitivity and referred pain, likewise, is especially valuable because of its practical significance. The last chapter gives a detailed summary of the surgery of the autonomic nervous system. Periarterial sympathectomy, sympathetic ganglionotomy and ramisection are surgical procedures which are being employed more and more in the treatment of many bodily disorders. Among those considered in this chapter are diseases of the blood vessels, spastic paralysis, arthritis, scleroderma, angina pectoris and visceral pain.

This excellent book well deserves a place on the reference text book list.

RUSSELL A. HIBBS, PIONEER IN ORTHOPEDIC SURGERY. 1869-1932. By George M. Goodwin. Cloth. Price $2.00. Pp. 136 with 17 illustrations. New York: Columbia Press. 1935. A short stimulating biography of a world renowned champion of the cripple.

Russell A. Hibbs was born on a farm in Southwestern Kentucky along the banks of the Ohio River. After attending a small country school, Russell attended Bethel College and Vanderbilt Medical School, beginning his practice of medicine in Texas. In 1893 he went to New York to begin a career which was to elevate him to the front ranks of benefactors of cripples. A pioneer in the application of scientific principles of surgery to the benefit of cripples, he guided the destinies of the New York Orthopaedic Dispensary and Hospital from status of a home to that of an outstanding clinic.

The romantic story of this famous surgeon is an inspiration to embryo medicos and laity alike.

An appendix contains a résumé of Dr. Hibb's scientific contributions.

ORTHOPEDICS FOR TEACHERS OF CRIPPLED CHILDREN. By Samuel W. Boorstein, Associate Visiting Surgeon Hospital and Attending Surgeon Bronx Hospital, New York City. Cloth. Pp. 120. 1935. Aidem Pub. Co., 349 E. 149th Street, New York.

This work consists of an elaboration of some lectures given by the author before a group of teachers and prospective teachers of crippled children in New York City. The contents cover the entire gamut of physical infirmities with which the physically handicapped are afflicted, beginning with diseases and disabilities of bones and joints, congenital and acquired deformities, osteomyelitis, fractures, tumors, paralyses of the extremities, static deformities, afflictions and disabilities of the nervous system.

One of the basic principles which teachers of crippled children must constantly keep in mind, and especially the physical therapists, the author insists, is that every bone in the body is built for precisely the function it is to perform; in other words a bone is the effect of function. Malfunction therefore results in deformities. Obviously, therefore, one must be on the alert to see that, due to weakness or discomfort, the body or its members are not permitted to take on an irregular or unbalanced position. In addition to the above, and aside from the regular class room instruction, the chief concern of teachers of crippled children is restoration of function, through the use of proper exercises and the different techniques of physical therapy.

In Chapter VI which covers forty-one of the one hundred five pages of textual material, the different afflictions of the physically handicapped are described, in a vernacular which any grade teacher can understand. This chapter alone would make Dr. Boorstein's book almost indispensable to any teacher engaged in crippled children's work. What every such teacher ought to know about the physically handicapped is here offered in a clearer and more concise manner than can be found anywhere else.

In the final chapter, there is presented a discussion of body mechanics and health, which is designed for mothers and teachers of the regular grades as well as for those dealing with the handicapped. It has to do with posture, poor musculature, round shoulders, habit scoliosis, lordosis, gait, foot strain.

This book should constitute a part of the library of all those who deal in any intimate way with the handicapped.

ELEMENTARY HUMAN ANATOMY. By Katherine Sibley. Price $4.50. Pp. 360. Illustrations 213. A. S. Barnes and Company, New York, 1935.

This text for an undergraduate course in human anatomy is written as a foundation course for the study of kinesiology and physiology and for students and teachers of physical education.

Anatomy is at best a bewildering subject for the beginner. Miss Sibley has presented it with simplicity and has laid emphasis on the phases that are most useful to the teacher of corrective gymnastics, such as osteology, myology, and the nervous system.

The value of the book as a text is considerably enhanced by the excellent choice of illustrations which have been selected from various anatomy texts.

Chapter IV, Myology, is particularly helpful. The author refers frequently to such authorities on muscle function as Beevor, Wright, and McKenzie.

The sections on laboratory studies and the bibliography at the end of each chapter offer many valuable suggestions to the teacher of elementary anatomy.

The large type, clear outline and paragraph headings make the text easy to study.

The clear-cut presentation of material will stimulate further study on the part of the student. We can heartily recommend its use by teachers and students of physical education.

SHORT WAVE THERAPY. The Medical Uses of Electrical High Frequencies. By Dr. Erwin Schliephake, Privatdozent for Internal Medicine at the University of Jena. Authorized English translation by R. King Brown, B.A., M.D., D.P.H. from the second and enlarged German edition. With foreword by Elkin P. Cumberbatch, M.A., M.B., B.Ch. Cloth. Price, 21/-. Pp. 238, with 94 illustrations. London: The Actinic Press, Ltd., 1935.

This first English translation of the widely quoted work of Dr. Schliephake makes readily available to American physicians and investigators the views of the Schliephake school of thought on the effects and medical uses of so-called short wave condenser fields. The book is nicely printed on a good grade of paper, well bound, and profusely illustrated. It covers the more elementary physical principles upon which high frequency vacuum tube oscillators are constructed and operate; experimental work done by Schliephake and others on the specific thermal and bactericidal effects of short waves; and the clinical applications of short wave condenser fields.

Selective heating can be obtained in vitro by the use of appropriate frequencies, but unfortunately in the living subject the circulating blood acts as a great equalizer of temperatures. In fact, by actual measurement of temperatures in living patients, the condenser field, regardless of wave length, has in many cases been shown to be inferior to ordinary diathermy in ability to heat the deeper tissues.

Schliephake reports a selective lethal action with specific wave lengths on various micro-organisms in vitro at 37° C., and postulates that there is a definite wave length which has the most harmful effect and most quickly destroys the bacteria. Confirmation of this work is lacking and has not been observed by the American investigators Mortimer and Osborne. On the other hand, much evidence is at hand in refutation. In this country Hicks and Szymanowski, working with 2.5 meters on streptococci, staphylococci, B. diphtheriae, bacteriophage, and precipitating antibody for pneumococcus, on the course of experimental infection in animals, on specific desensitization, and on immunization by irradiated toxins, explain the effects on the basis of the elevation of temperature produced. Izar and Famulari, working with 4, 8 and 15 meters on B. typhosus, paratyphosus, dysentery Shiga, Ceylon A. and B., and proteus, report these microorganisms unaffected by a twenty minute treatment. Groag and Tomberg, in analyzing the results of Haase and Schliephake that bacteria in culture are killed at 37 C. by exposure to the short wave field bring out the interesting explanation that because of "point heating", the bacteria may be brought above their thermal death point, which is essentially higher than the temperature of the surrounding medium. They remark that it is not necessary, as Haase and Schliephake do, to invoke a new mechanism as a specific lethal action of short waves, which action in no wise was proved by their experiments. Groag and Tomberg repeated the work of Liebesny with the 4 meter and 15 meter wave on Actinomyces bovis, Trichophyton tonsurans and B. coli, and reached the conclusion that the destruction of cultures by means of short waves is possible in every case so long as the electrical energy of the field suffices to generate the necessary point heat that brings the organisms above their thermal death point. Liebesny's other observation that bacterial growth may be promoted by short waves may also be explained by "point heating", which raises the temperature of the micro-organisms to their optimum temperature for growth.

Hasche and Leunig exposed cultures of staphylococci and streptococci in distilled water, saline solution, bouillon and milk on agar plates to short waves (from 8 to 16 meters) of different intensities for periods of time up to eight and one-half hours and observed no inhibitory or destructive effect on the bacteria. Eidinow exposed suspensions of bacteria in serum to wave lengths ranging from 3 to 5 meters, eliminating the heating effect, and reports that he was unable to demonstrate any bactericidal action. Mortimer and Osborne subjected broth cultures of staphylococci, streptococci, B. melitensis, gonococci, meningococci and B. typhosus to a 6 meter wave for twenty minutes, during which time the temperature of the culture rose to 40° C. without observing any change in the growth of the micro-organism. They also subjected rats with experimental penumonia for three minutes daily to the 6 meter wave without observing any change in the fatal course. Hasche and Leunig of Berlin experimented with electric fields ranging in wave length from 3.5 meters to 16 meters. They conclude that it would seem to be proved beyond doubt that the short electrical waves down to a wave length of 3.5 meters *do not possess* an immediate bactericidal effect.

Further investigation would seem to be indicated to substantiate the claims set forth by Schliephake and his followers as to the specific thermal and bactericidal action of short waves. Undoubtedly the employment of condenser fields offers some advantage from the standpoint of convenience over ordinary diathermy. However, since the effects obtained with high frequency currents can be explained according to the more careful experimenters on the basis of the generation of heat, it does not seem possible to achieve results except from the physiological action of heat.

MANIPULATIVE METHODS IN THE TREATMENT OF FUNCTIONAL DISEASE. By E. L. Hopewell-Ash, M.D. Cloth. Price 3/6. Pp. 92. London, John Bale, Sons and Danielsson, Ltd., 1935.

This small volume describes the author's views on the use of manipulative measures which are particularly useful in support of his routine use of direct suggestion. In functional diseases the author advocates the use of light, rhythmical stroking massage, and local vibratory or percussion effects, and condemns the so-called manipulations of vigorous thumping. His results with psychotherapy are so good that it leaves a doubt in the reader's mind of the value of the manipulations used.

The author's views on the value of neuromedical manipulation are entirely too optimistic. He states: "As a basic rule of treatment it may be laid down that there is no organ, no disease, no part of the body, no system, no chemical imbalance that cannot be reached by manipulation or neuromedical treatment where there is a proper understanding of anatomy and physiology coupled with experience of the necessary technical processes." This book cannot be recommended to physical therapists.

COMMON DISEASES OF THE SKIN, By S. William Becker, M.S., M.D., Associate Professor of Dermatology, School of Medicine, University of Chicago. A National Medical Monograph, Edited by Morris Fishbein, M.D. Cloth. Pp. 283, with 83 illustrations. Price $4.00. *New York, National Medical Book Co., Inc.* 1935.

This volume presents the more common diseases of the skin in lecture style which makes it more valuable for the student than is the encyclopedic style of the more complete textbooks on dermatology. The more common diseases of the skin are well described. The treatment for each condition is considered briefly, and only one or two of the methods now in general use are given. The photographic illustrations are excellent. It can be recom-

mended to physical therapists interested in dermatology, and in the conservative and latest information of the accepted forms of therapy for the more common diseases of the skin.

HOSPITAL ORGANIZATION AND MANAGEMENT. By Malcolm T. MacEachern, M.D., C.M., D.Sc., F.A.C.P., F.A.C.H.A., Associate Director, American College of Surgeons and Director of Hospital Activities. Cloth. Price $7.50. *Pp.* 944, *with 22 illustrations. Chicago, Physicians Record Co.,* 1935.

The author of this volume has spent a lifetime in the study of this subject. In his work on hospital standardization for the American College of Surgeons, he has visited more hospitals and has been consulted on more hospital problems than any man in the hospital field.

Every field of hospital administration is considered. There are chapters on promoting and building a new hospital, organization of the hospital, admitting department, medical staff, clinical departments, adjunct diagnostic and therapeutic facilities (under which the physical therapy department is considered), the nursing, dietary, outpatient, social service, medical records, business, and service departments. There are excellent chapters on ethics and public education.

It is a book that can be highly recommended to every physical therapist who has hospital administrative problems.

THE THEORY OF GYMNASTICS. By Johannes Lindhard, M.D. Professor at the Gymnastic Physiological Laboratorium of the University of Copenhagen. Translated from the Danish. Used as text book in England. Methuen and Company, Ltd., London. 1934.

Dr. Lindhard's work is a thorough critical analysis of the system as used in Denmark for years. It also treats the history of gymnastics, its ethical and aesthetic aspects, and throws new light on the influence of gymnastic movements on the anatomy and physiology of men, women, and children, stressing the necessity for differentiation and warning against abuse in work with school children.

The analysis of the standing and walking positions, of the breathing exercises, of the influence of exercises on the spine and its physiological curves has probably never before been done in such thorough and instructive manner, nor with such knowledge behind it. One must bear in mind, however, that the discussion has reference all the time to healthy individuals, not to orthopedic problems.

SHORT WAVE THERAPY AND GENERAL ELECTRO-THERAPY. By Heinrich F. Wolf, M.D., Consultant Department of Physical Therapy, Mount Sinai Hospital; Director of Department Physical Therapy, Neurological Hospital, Welfare Island; Chief, Arthritis Clinic, Union Health Center; Cloth. Pp. 104 *with 80 illustrations. Price* $2.50. *New York, Modern Medical Press,* 1935.

In this small book, the author attempts to show by illustrations the methods and various technics for the application of the modalities comprised under electrotherapy. The author states that the present volume does not pretend to be a textbook on physical therapy nor to replace one. However, since the text which accompanies the illustrations is so brief and restricted, a question arises in one's mind as to the intended purpose of the book.

The author states that he heartily approves "the policy of the American Medical Association not to allow manufacturers to make suggestions in their literature as to the indications of treatment in various pathological conditions." Yet in this volume is "a list of the most important indications as reported in the literature." This list is alphabetically arranged, beginning with acne and running through sixty diseases to ulcus cruris. Incidentally, it is noted that a manufacturer advertises that this book will be given free with each machine purchased.

It is to be regretted that this brief book does not measure up to the high standard of the author's former work, "A Textbook of Physical Therapy."

FIRST INTERNATIONAL CONFERENCE ON FEVER THERAPY

The first international meeting on fever therapy will be held in New York City, September, 1936. The use of fever induced by physical and other agencies as a therapeutic procedure has received universal attention in the past few years. The conference will aim to collect and crystallize available data in this field. Therapeutic, physiological and pathological phases of fever will be discussed.

It is planned to translate abstracts of all the papers into French, English and German. In order to make the printed copies of the transactions available for the conference, it is necessary that manuscripts and abstracts be sent in not later than June 1, 1936. Those interested in participating are requested to make early application.

Further information concerning the conference may be obtained from the Secretary.

Baron Henri de Rothschild, *Chairman,*
Paris, France.

Dr. William Bierman, *Secretary,*
471 Park Avenue, New York City, U. S. A.

MISSISSIPPI VALLEY MEDICAL SOCIETY

The second annual meeting of the Mississippi Valley Medical Society will be held at the Hotel Burlington, Burlington, Iowa, September 30, October 1-2, 1936. At a meeting of the Board of Directors held in Quincy, Illinois, on November 10th, the following officers were elected for 1936:

President, H. B. Goodrich, M. D., Hannibal, Missouri.

President-Elect, F. B. Dorsey, Jr., M.D., Keokuk, Iowa.

First Vice-President, Dan G. Stine, M.D., Columbia, Missouri.

Second Vice-President, J. C. Steiner, M.D., Quincy, Illinois.

Third Vice-President, J. I. Marker, M.D., Davenport, Iowa.

Secretary-Treasurer, Harold Swanberg, M.D., Quincy, Illinois.

The Society is being incorporated for non-pecuniary profit in Illinois with registration in several states.

The first meeting held at Quincy, Illinois, last October was most successful. There were 300 registered from ten states, with forty-eight papers read by thirty-six clinicians. Plans are under way to greatly augment the present membership and to make the Burlington Assembly in 1936 the largest medical meeting ever held in Southeastern Iowa. The Board of Directors at their recent meeting voted to continue the $5.00 fee for membership and first years' dues, $2.00 for annual dues, and $3.00 registration fee for non-members at the annual meeting.

HARVARD MEDICAL SCHOOL, COURSES FOR GRADUATES

Physiotherapy (7 Weeks)

Harvard Medical School, Children's Hospital and Allied Institutions
June 22—August 7
By Dr. Arthur T. Legg, Dr. James W. Sever and Miss Janet B. Merrill

Instruction in Orthopedics, Neurology and the pathology of the conditions included in the course, will be given by the surgeons of the special clinics used for demonstrations.

Anatomy, functional anatomy, the treatment of infantile paralysis, fractures, industrial accidents, arthritis, lateral curvature of the spine, faulty body mechanics and neurological lesions in children, will receive attention.

Applicants must be teachers of Physical Education, whose training has included human anatomy, or graduates of accredited Schools of Nursing, who have had postgraduate work in functional anatomy and practical experience in therapeutic exercise. ADMISSION SUBJECT TO APPROVAL OF INSTRUCTORS.

An official statement will be granted to those who complete the course satisfactorily, or, if prior arrangements have been made, the course may be counted for credit at the Gradute School of Education of Harvard University.

FEE $100

For further information write to Assistant Dean, Course for Graduates, HARVARD MEDICAL SCHOOL, Boston, Massachusetts.